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Interval cycles and symmetrical formations as generators of melody, harmony, and form in Alban Berg's string quartet Opus 3, and, "LYRICSCAPE." [Original composition]

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INTERVAL CYCLES AND SYMMETRICAL FORMATIONS AS GENERATORS OF MELODY, HARMONY, AND FORM IN ALBAN BERG'S STRING QUARTET OPUS 3

and

LYRICSCAPE

by

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Abstract

INTERVAL CYCLES AND SYMMETRICAL FORMATIONS
AS GENERATORS OF MELODY, HARMONY, AND FORM
IN ALBAN BERG'S STRING QUARTET OPUS 3
and
LYRICSCAPE

by

Charles E. Porter

Advisor: Professor George Perle

The dissertation consists of the composition, LYRICSCAPE, for chamber orchestra and the paper on Berg's Opus 3. The paper investigates three ways by which Berg articulates the form of Opus 3. The first of these is the placement and treatment of themes. As an adjunct to this the relationships of the various themes to each other, to interval cycles, and to the harmony are examined. The second avenue of investigation is that of interval cycles. In opus 3 Berg has used interval cycles as generators of both local and long range linear progression. Embedded interval cycles operate throughout the composition and are basic to understanding Berg's formal divisions.

Ten non-Schenkerian graphs (45 pages) depict the use of embedded interval cycles on different levels of each movement ranging from deep background to foreground. The third area of exploration is that of symmetrical formations. Historically the second movement is the first instance (1910) of the use of symmetrical formations to achieve important formal ends. A brief explanation of sum dyads, cyclic sets, and symmetry--all components of Berg's musical language that find their most sophisticated employment in Lulu--is followed by local examples from both movements. The second movement as a whole is then examined and its background cycles and important sums related. Finally the fundamental interval cycles of both movements are investigated as a complex for their symmetrical and musical implications. An annotated bibliography of Opus 3 sources is included.

List of chapters: I. History and Preliminaries, II. Interval Cycles and Embedding, III. First Movement Themes and Thematic Relationships, IV. First Movement Formal Divisions, V. First Movement Graphs, VI. Second Movement Themes and their Relations to those of the First Movement, VII. Second Movement Formal Divisions, VIII. The Relationship Between the First and Second Movements, IX. Second Movement Graphs, X. Harmony, XI. Symmetry, XII. Conclusions, Bibliography.

PREFACE

I first met George Perle in 1978 as a composition student in his graduate course at Queens College. It was at this time that I became aware of Perle's role as an analyst and advocate of the music of Alban Berg. I also became better aquainted with Perle's own compositions and learned of the connections between Perle's own compositional practice, which he calls twelve-tone tonality, and Berg's compositional procedures. A most important link is Berg's master array of interval cycles.[1] I began to immerse myself in the study of twelve-tone tonality with Perle in 1980, composing many short exercises. My first large-scale composition employing twelve-tone tonality was the String Quartet of 1982. All my compositions since this work, including the composition portion of this dissertation--Lyricscape for chamber orchestra, strictly employ the language of twelve-tone tonality. A chance remark in 1982 by Perle in his Post-diatonic Tonality graduate seminar aroused my interest, " No one has done anything yet with Opus 3."[2] My unpublished paper written for this class, " A Discussion of Voice-leading and Harmony in Alban Berg's String Quartet Opus 3/I," was the result of my initial contact with the work. This paper focuses

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[1] George Perle, "Berg's Master Array of the Interval Cycles," The Musical Quarterly, 63/1, (January 1977), 5.; George Perle, Twelve-Tone Tonality (Berkeley and Los Angeles: University of Califonia Press, 1977), 76-79.

[2] The selected and annotated bibliography at the conclusion of this paper confirms that Perle's assessment of the state of Opus 3 scholarship was substantially correct.

on the use of interval cycles and whole-tone collections in the forty bars of the first movement that comprise the second-theme group of the exposition. I suspected then that there was some kind of large-scale procedure in Opus 3 that was directly responsible for the formal divisions within the movements. I also wondered whether there might be a deeper connection between the two movements than simply that the opening theme of the first movement also ends the second movement. This dissertation addresses these and other questions.

I wish especially to thank George Perle for serving as my advisor for this project at a time when he has retired from teaching and his prominence as a composer has resulted in more commissions and deadlines than ever. His teaching, writings, and compositions have been the most important influence on my musical development and indeed led to the inception of this project. I also wish to thank Elliott Antokoletz for serving as outside reader. His detailed and penetrating comments have been of emmense value to me and his Bartók scholarship has been a model and inspiration for this study. Joel Lester has also provided many detailed and valuable comments which have led me to improve the organization and readability of this paper. I also wish to thank the other members of my committee, Leo Kraft, Bruce Saylor, and Henry Weinberg for their efforts on my behalf. Arthur Maisel was a valuable sounding board in numerous discussions during the course of the project. I am also deeply grateful to Mary, my wife, who has supported this project in uncountable ways which have included proofing, editing, and encouragement.

C.P.

CONTENTS

Chapter I

HISTORY AND PRELIMINARIES

Alban Berg completed his String Quartet Opus 3 in 1910.[1] The quartet, which was premiered on April 24, 1911[2], is Berg's first

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[1] Douglas Jarman on page 5 of The Music of Alban Berg (Berkeley and Los Angeles: University of California Press, 1979) reports that "the first movement of the work was completed by 30 May, on which date Berg wrote to Webern that he was busy rehearsing it...The second movement was completed in July of that year" (1910). He also reports that the manuscript, which Redlich [Alban Berg (London, 1957), 296] described as lost, is in the Austrian National Library.

[2] The work was premiered by an ad hoc quartet in Vienna's Ehrbar Hall on a program promoted by the Akademischer Verband fur Kunst und Literatur. The program also included Berg's Piano Sonata Opus 1, string quartets by Horwitz and Webern, and Webern's Four Pieces for Violin and Piano Opus 7. The critic Paul Stauber reviewed the concert in the *Illustrierte Wiener Extrablatt* saying of Opus 3, "Under the cloak and name "String Quartet," this genre is maltreated at the instigation of Mr. Alban Berg." The quartet was not publicly performed again for twelve years. On August 2, 1923 The Havemann Quartet presented it at the first International Festival for Chamber Music in Salzburg. This performance was a great success and Berg wrote that it was, "artistically, the most wonderful evening of my life" (Letter #337 dated August 3, 1923 in Alban Berg Letters to his Wife, trans. by Bernard Grun [New York: St. Martin's Press, 1971], 325.) As a direct result the quartet was accepted for publication by Universal Edition (Berg had initially published it at his own expense in 1920) and received numerous performances throughout Europe. The quartet's performance history is given in Alban Berg, by Willi Reich, translated by Cornelius Cardew (New York: Harcourt, Brace & World Inc., 1963), 34 and 37. Berg's vivid account of the 1923 performance is found in letters #335-340 of July 31-August 6, 1923 in Alban Berg Letters to his Wife, 322-331.

mature work and the last that he composed under the tutelage of Arnold Schoenberg. In 1936, after Berg's death, Schoenberg wrote, "his String Quartet (Opus 3) surprised me in the most unbelievable way by the fulness and unconstraint of its musical language, the strength and sureness of its presentation, its careful working and significant originality. That was the time when I moved to Berlin (1911) and he was left to his own devices. He has shown that he was equal to the task."[3]

Opus 3 belongs to the Second Viennese School period of so called "atonal compositions" written before Schoenberg formulated his stricter twelve-tone style. Beyond its purely musical excellence and important position in Berg's compositional development, Opus 3 is significant because it takes on large-scale instrumental form in an atonal idiom at a time when Schoenberg and Webern had yet to present their own solutions to this problem. Second Viennese School works of this time are noteworthy for their brevity. Schoenberg's Six Little Piano Pieces, Opus 19 (1911) and Webern's Five Movements for String Quartet, Opus 5 (1909), Six Pieces for Large Orchestra, Opus 6 (1909), and Four Pieces for Violin and Piano, Opus 7 (1910) are true miniatures. Schoenberg's Three Piano Pieces, Opus 11 (1909) and Five Orchestral Pieces, Opus 16 (1909), while not miniatures, are also not large-scale compositions. In this "atonal" idiom Berg was forced to find new ways to articulate form since he no longer had the benefit of common practice harmony, which had played such an important role in the articulation of sonata, rondo,

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[3] Reich, Alban Berg, 29.

ternary, and other traditional forms, and did not yet have the strictures of Schoenberg's twelve-tone method to draw on for formal possibilities.[4]

This paper investigates three ways by which Berg articulates the form of each movement of Opus 3. The first of these is the placement and treatment of themes. As an adjunct to this the relationships of the various themes to each other, to interval cycles, and to harmony are examined. A major portion of the paper is devoted to graphs which depict the use of interval cycles on the different levels of each movement ranging from deep background to foreground. These cycles are basic to understanding Berg's formal divisions and comprise a second avenue of investigation. The third area of exploration is that of symmetrical formations.

Perle has noted that the String Quartet Opus 3 employs interval cycles on its musical surface and also that symmetrical formations, both melodic and chordal, are present in the second movement.[5] He further writes that "progression through interval cycle is a

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[4] For a discussion of the problem of large-scale form in an atonal idiom which includes citations of Theodore W. Adorno and Igor Stravinsky see George Perle, The Operas of Alban Berg Volume One/Wozzeck (Berkeley and Los Angeles: University of California Press, 1980), 6-7 and 16-17. This problem is also mentioned by Mosco Carner, Alban Berg (London: Duckworth, 1975), 102 and by Jim Samson, Music in Transition (New York: W.W.Norton & Company Inc., 1977), 180-85.

[5] George Perle, "Berg's Master Array of Interval Cycles," The Musical Quarterly 63/1 (January 1977) 4-10; George Perle, Twelve-Tone Tonality (Berkeley and Los Angeles: University of California Press, 1977), 76-79.

persistent feature of Berg's musical language, beginning with the second song of Opus 2."[6] Interval cycles in songs 2 and 4 of Opus 2 are shown in example 1a. Later twelve-tone compositions also employ interval cycles. Example 1b demonstrates that both the Lyric Suite and the Violin Concerto, have rows which are based on interval cycles. There are further examples in Wozzeck and Lulu.[7] The master array of the interval cycles that Berg, while composing Wozzeck in 1920[8], sent to Schoenberg is further proof of Berg's deep interest in cycles. Opus 3 represents a particularly important step in the development of Berg's handling of cycles as evidenced by their pervasive presence and large-scale formal implications.

The use of symmetrical formations in the second movement of Opus 3 is special. The manner of composition indicates that symmetry is not just a by-product of interval cycles, but rather is an operative dimension that is used to achieve important formal ends. It is one thing to compose with interval cycles, and quite

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[6] George Perle, The Operas of Alban Berg II/Lulu (Berkeley and Los Angeles: University of California Press, 1985), 161. Jarman, The Music of Alban Berg, 21, writes: "Thematic and harmonic material derived from pitch cycles consisting of specific interval class is a frequent and consistent feature of Berg's music."

[7] See Perle, The Operas of Alban Berg I/Wozzeck, 124-125, where a passage in Wozzeck consisting of four aligned cycles of intervals-1, -2, -3, and -4 is discussed. See also Perle, The Operas of Alban Berg II/Lulu, 94 and 165, where the background structure of the Basic Series of Lulu is shown to be the cycle of fifths; 103 where Schigolch's serial trope is shown to be essentially a semitonal cycle.

[8] Perle, "Berg's Master Array of Interval Cycles," 5.; Twelve-Tone Tonality, 76-79.

another to understand that harmonic progression can be produced by combining two inversionally related pairs of interval cycles. Berg must have understood in 1910, at least on an intuitive level, that symmetrical formations offered potential solutions to problems of harmony and of large-scale form. The String Quartet is among the earliest examples of works in which symmetrical pitch configurations occur. But more importantly it is perhaps the earliest work in which symmetrical pitch formations actually play a sustained role.[9]

There is a substantial body of scholarship that is concerned with the principles of symmetrical relations and the relation of interval cycles and interval collections to symmetry. Symmetrical formations have been found to play significant roles in the music of Berg, Schoenberg, Webern, Bartók, Stravinsky, and Scriabin.[10] This

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[9] George Perle has told me on several occasions, which include a 3/22/88 phone conversation, that, to his knowledge, Opus 3 is the earliest work to use symmetrical pitch formations in an important formal way. I also have in my possession a copy of a letter dated 2/6/88 that Perle wrote to the conductor, David Zinman, in which during a discussion of sums and symmetry he states " I've traced this sort of thing all the way back to Berg's Opus 3 string quartet (1910)." Opus 3 is the earliest work that Perle cites as using symmetry in his third chapter, "Symmetrical Chords and Progressions," of Twelve-Tone Tonality, 12-13. In a letter to me dated 2/21/88 Elliott Antokoletz says of Opus 3 that it is "an ideal study since it is probably the earliest to involve the special type of symmetrical modulations so relevant later on with Berg and Bartók."

[10] Important sources on symmetrical formations in post-diatonic music include: Elliott Antokoletz, Principles of Pitch Organization in Bartók's String Fourth Quartet, Ph.D. dissertation, City University of New York, 1975.; Elliott Antokoletz, The Music of Bela Bartók (Berkeley and Los Angeles: University of California Press, 1984).;

suggests the existence of a common harmonic language based on the use of all twelve tones in a symmetrical manner. It is this language which is described by George Perle in his book Twelve-Tone Tonality.

Elliott Antokoletz, "Interval Cycles in Stravinsky's Early Ballets," Journal of the American Musicological Society, 39/3 (Fall, 1986), 578ff. ; Bruce Archibald, "Some Thoughts on Symmetry in Early Webern: Op. 5, No. 2," Perspectives of New Music, X/2 (1972), 159ff.; Douglas Jarman, "Alban Berg: The Origins of a Method," Musical Analysis 6:3, (1987).; George Perle, Serial Composition and Atonality, 5th edition(Berkeley and Los Angeles: University of California Press, 1981); Perle, The Operas of Alban Berg I/Wozzeck and II/Lulu.; George Perle, "Scriabin's Self-Analyses," Music Analysis 3:2 (1984), 101ff.; George Perle, "Symmetrical Formations in the String Quartets of Bela Bartók," Music Review Vol XVI (1955), 300ff.; Leo Treitler, "Harmonic Procedure in the Fourth Quartet of Bela Bartók, "Journal of Music Theory, Vol. III (1959). 292ff.

Chapter II
INTERVAL CYCLES AND EMBEDDING

In Opus 3 Berg has utilized interval cycles as generators of linear progression. These cycles are most apparent on the foreground level of the work but also exist in middleground and background levels of structure. Berg relates different cycles through their pitch content. A single pitch can serve as a simultaneous member of two or more cycles or collections, as an axis for the unfolding of two inversionally related cycles, or as a simultaneous goal tone for several cycles. Berg often embeds one interval cycle within the larger context of another. This practice of embedding interval cycles means that cycles are often interrupted by other pitches. Therefore the existence of a particular cycle must be interpreted from the musical context. It is only the cycles that are of the most local nature (like those cited by Perle, see Chapter I, footnote 5), those closest to the foreground, that are composed without intervening notes. There are many musical indications of the practice of embedding. These include marking notes by register, type and color of attack, and rhythmic emphasis. Despite these indications it must be readily admitted that not all instances of embedding are clear cut. Sometimes several readings are possible.

Example 2 illustrates the concept of embedded interval cycles. A cycle of ascending fifths is shown in example 2a in which a beamed cycle of ascending major seconds and a beamed cycle of ascending major thirds are embedded. In this paper intervals are

described by their semitonal content, thus a half-step is 1 and a major third is 4. All cycles are viewed as interval classes and so are always labeled with a number less than 7. A plus or minus sign is used to indicate direction. For example C-G-D would be called c-5 and C-F-Bb would be called c+5. Example 2a can be described as a c-5 in which are embedded c+2 and c+4. Example 2b shows how a c+4 can have three c+3s embedded within it. Berg does not usually embed his cycles in such a regular fashion. The following examples from Opus 3 illustrate various aspects of embedding.

Example 3a, which consists of the second movement violin I bars 1-2, shows how a collection can be embedded in a context where obvious surface cycles are scarce. In this example the c3 collection (F#-Eb-C-A) is articulated. Each of the four slurred segments concludes with a member of this c3 collection. Usually this concluding note receives the longest rhythmic value within its segment. These pitches are additionally emphasized by being either the highest or lowest of their slurred segment and by dynamic and staccato accents. Further emphasis for the c3 collection is present in the second segment, which begins with A, and in the fourth segment, whose highest note is C.

Example 3b, the second movement cello of bars 137-141, illustrates a c+4 embedded in a c-1. Each pitch of c+4 (Bb-D-F#) is articulated through its placement as the first and highest and note of its slurred segment.

Example 3c consists of the first movement violin I bars 63-71. Here a longer distance c+4 has embedded within it three c-2 segments. Each member of c+4 (C-E-G#) is clearly articulated as

the third note of an upwardly leaping motivic figure; as the first, the highest and the loudest pitch of its segment; and by its rhythmic placement on a downbeat. Each of the c+4 pitches serves as the initial pitch of a four-note c-2 segment (**C**-Bb-Ab-Gb; **E**-D-C-Bb; **G#**-F#-E-D). The completion of the third c-2 segment is compositionally delayed in bars 68-69 by withholding the last two notes of the segment, E and D. An embedded c+1 (C#-D-D#), found as the first note of each statement of the upwardly leaping motive, justifies this delay. This c+1 can be understood to continue with the E and F of bar 70. It is not until bar 70 that all four notes of the c-2 segment, G#-F#-E-D, are heard. A new twist occurs here. D functions both as a member of the c-2 segment and also as a member of the c3 collection G#-F-D-B. The slurring of bar 70's c-2 segment, which differs from that of the previous c-2 segments, suggests this. The c3 collection is articulated in the second slurred segment of bar 70 which concludes in bar 71. D initiates the slur, B concludes it, and F is its highest note. G# is also present since it initiated the c-2 segment which D concluded.

In example 3d, first movement violin I bars 50-57, Bb serves as a common tone between a cycle 2 segment and a c3 collection in much the same way D did in the previous example. Bb of c+2 (Bb [bar 50]-C-D[both bar 56]), is prolonged in the bars 51-55 through its momentary reinterprtation as a member of the c3 collection C#-E-G-Bb. The grace notes (B-F) of bar 56 belong to the same whole-tone collection (**B**-C#-D#-**F**-G-A) as the previous C#. The grace notes (G#-D-Bb) of bar 57 belong to the whole-tone collection (C-**D**-E-F#-**G#**-**Bb**) of bars 56-57.

Example 3e consists of the first movement cello bars 10-14. In this example a longer distance c-1 (Ab-G-F#) has c2 collections appended to its last two pitches. C-1 is musically articulated by the rhythmic placement of each of its notes on a downbeat and by their longer durations. The embedded c2 collections are generated by statements of the main theme of the string quartet. C-1 three-note segments are embedded within the c2 collection. These are diminutions of the larger scale c-1.

Example 3f, first movement violin II bars 1-5, is the main theme of the string quartet. In this theme B serves as a member of a c2 collection (F-Eb-Db-A-**B**) and as the axis of two interval-1 cycles of opposite direction (c+1: **B**-C-C#-D; c-1: **B**-Bb-A). B is also rhythmically stressed by its length and downbeat placement. B will be shown in later chapters to have a special priority in the quartet as a whole.

Example 3g, first movement violin I bars 96-99, is similar to the previous example in that there is a single pitch, in this case G, which serves as an initiating axis for two interval-1 cycles of opposite direction(c+1: **G**-Ab-A-Bb-B-C; c-1: **G**-F#-F-E-Eb-D-Db-C). These diverging cycles do not move at the same rate. However, they do both conclude on C. These two C's are connected by means of a c-4 (C-Ab-E-C). Even the grace notes of the passage, B-Bb-A, comprise an embedded cycle. The double-stopped grace notes (D-A) of bar 98 combined with the following G and C form a c5 collection (C-G-D-A).

Example 3h, second movement cello bars 201-205, illustrates a greater level of cyclic complexity than previous examples. The

most obvious cycles begin in bar 201 where descending interval-1 cycles appear in the upper (A-Ab-G-F#-F) and in the lower (C-B-Bb; Ab-G-F#-Gb-E-Eb-D) registers of this polyphonic melody. However, c2 and c4 collections are also important. This is especially true of bars 203-204 where each note of the c4 collection (G-B-D#) initiates a new slurred segment.

Example 3i consists of the first movement cello bars 48-81. This extended example illustrates how Berg embeds various cycles and collections within longer distance interval-5 cycles. Bars 50-51 repeat bars 48-49 transposed up an octave. That Bb is the essential tone is indicated by its occurrence on the downbeat, its duration, and the dynamics. Berg uses the whole-tone collection and semitonal cycle in bars 52-56 to delay the anticipated (from the fifths in bar 51) arrival of the low C#. There is a slight emphasis on C# in the "wrong" register at bar 53 as a temporary substitute for the lower C#. This is brought about by the uninterrupted statement of the whole-tone collection, complete but for C#, in bars 53-54. Just before C# is reached D is introduced. This non-member of the C# whole-tone collection serves to set off C#. The semitonal cycle, which then fills out the octave to low C#, serves to further delay and emphasize the goal tone. The use of pizzicato to enunciate the final G# to C# perfect fifth serves to make the background c-5 clearer. The leap from C# to G# after a semitonal cycle gives G# prominence. The semitonal cycle is reintroduced beginning on this G#. The omission of C# in bar 57 leaves no doubt that it is no longer important as it was in bars 52-56. Its absence also serves to promote D#. D# is further emphasized since it is left by a leap

rather than a step. In the final three sixteenths (F-Db-Bb) the intervening notes are omitted and then exclusively presented in bars 58-61. The arco ff on F at bar 58 gives it extreme emphasis. Bars 62-64 further prolong F through the presentation of its whole-tone collection and the descending semitone that leads to it in bars 63-64. There is an embedded Gb whole-tone cycle in bars 64-65. Note that the Bb of bar 66 is the next note of this cycle transposed by an octave. The sequential treatment of bars 68-70 with leaps to Eb, G#, and C# is an obvious indication of the background interval-5 cycle.

Bars 70-80 of example 3i illustrate the convergence of four different interval cycles on a unison B. The c-1 (E-Eb-D-Db-C-**B**) of bars 77-80 is clearly set off by being the voice of the lowest register and having the notes of longest duration. Each of the notes of the c-3 (G#-F-D-**B**) in bars 76-80 has parallel rhythmic placement as the last of a four-thirty-second-note motive and is additionally the highest or lowest pitch of the group. The c-4 (G-Eb-**B**) of bars 75-80 is produced by the parallel presentation of a motive which gives rhythmic emphasis to G in bar 75 and Eb in bar 76. This motive is then discontinued which has the effect of marking these pitches. In bars 64-80 c+5 (F-Bb-Eb-G#-C#-F#-**B**) serves as the background cycle for the other three which converge on B.

Berg's usual practice, as has been seen in the above examples, is to treat each of the four instruments separately. Thus, it is normal procedure for each to unfold its own cyclic configurations.

The development of the first movement is an exception to this general practice and features more cyclic crossing from one instrumental part to another than any other section of the movement. Other instances of interval cycles moving from one instrumental part to another do occur in both movements but are of limited importance and brief duration. These often occur when the normal registral distribution of the four instruments is upset, as for example when the cello shifts to the highest voice. It also is not unusual for notes of a cycle to be displaced registrally by an octave. That is to say, cycles do not always literally have just one direction.

Chapter III

FIRST MOVEMENT THEMES AND THEMATIC RELATIONSHIPS

Berg's employment of themes in Opus 3 is very complex and poses a number of problems. There are a great number of themes in each movement, some based on interval cycles, some derived from other themes in various ways, and some containing previously heard themes embedded within them. Additionally the processes of inversion, retrograde inversion, and intervallic expansion and contraction are utilized to develop certain themes. These complexities raise the basic question of what actually constitutes a theme. This is an important question since some of the themes included in this paper have received almost no mention by other analysts.[1] One criterion to be considered is length. Should a melody be called a theme and a short figure be called a motive?

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[1] These include in my labeling I Bridge, IIB, IID, and IIG. Only Bruce Archibald, Harmony in the Early Works of Alban Berg. ([unpublished PhD dissertation Harvard University, 1965], Examples Volume, 29 and 31) designates this melodic material as themes. However he does not delineate the individual themes in the same note groupings that I do. For a detailed comparison see my footnote 1 of Chapter Vi.

I have made no distinction between a theme and a motive.[2] Therefore all important melodic formations, whatever their length, are called themes. That a melodic figure deserves designation as a theme is determined by its sustained use over the course of a movement. Therefore all melodic figures designated as themes appear more than once. The themes are labeled with capital letters in the order of their appearance. These letters are reused in the sonata-form first movement with each new theme-group. Roman numerals I and II are used to indicate movements; Arabic numerals 1 and 2, in the case of the first movement, indicate first or second-theme group of a sonata-form. I2B therefore indicates first movement, second-theme-group, B theme (the second theme to enter in the second group). The first appearance of the theme is considered its prime form and obvious manipulations of this form such as inversion, dissolution, and interval contraction and expansion are not treated as new themes.

Example 4 shows the various themes of the sonata-form first movement. There are four themes associated with the first-

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[2] Jarman (The Music of Alban Berg, 34) uses the term 'cell' to describe short melodic figures which are transformed and rearranged in various ways to construct different longer themes. I agree with his general thesis that small melodic bits are used in various ways to form larger ones but choose to call each of these a separate theme rather than adopt the cell terminology. It is simply less complex and clearer in a detailed discussion of nineteen melodic units over the course of two movements not to differentiate by length and call some cells and others themes. Furthermore the bits that Jarman calls cells really do function as themes in and of themselves--they are developed and are stated numerous times--in addition to being used to build longer themes.

theme group, a single bridge theme, and five themes associated with the second-theme group. I1A-closing is so named because of its close relationship to I1A (see example 7a) and its closing position in phrases and sections in which it occurs. I1A, I2A, and I2D have head and tail sections which are indicated in example 4. These designations are useful since in the development and in the recapitulation-coda Berg splits these themes in half and associates the head of one with the tail of another. Within the same theme he also on occasion puts the tail before the head.

The rich web of connections between the themes of Opus 3 has been the focus of most of the very little analytical work that has been done on the quartet.[3] For the process of understanding and comparing the themes of the first movement two criteria will be utilized. The first of these is the cyclic content of each theme. These cycles are illustrated in example 5 through eighth-note beams. Themes I1A, I1B, I1A closing, I Bridge, I2A, I2B, I2C, and I2E contain interval cycles. In addition I2D contains a whole-tone collection (A, B, F, Eb) as does the head of I1A if the fourth note, A, is included with the c-2 (F-Eb-Db-B) which begins on the first note.

The second criterion is the intervalic content of the group of notes most basic to the outline of each theme. The final note of a theme is always part of this note group. Usually the first note is as

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[3] The most complete treatment of this aspect of the quartet is found in Klaus Schweizer, Die Sonatensatzform im Schaffen Alban Bergs (Stuttgart: Musikwissenschaftliche Verlags-gesellschaft, 1970), 78-85. There is a less complete but valuable discussion in Jarman, The Music of Alban Berg, 32-4.

well, but sometimes, as in I1C and I2D, the first note functions as a kind of leading tone and so is not. In I2C the effect of the first note is rhythmically that of a leaping grace note, so here too the second note is not deemed to be basic to the theme's outline. The choice of other notes is based on the theme's contour as articulated by phrasing, register, and rhythm. In several cases the outline of a theme turns out to be an interval cycle. Example 5 shows the interval cycle content of each one of the first movement themes with beamed eighth notes and also illustrates their outlines using half notes. Repeated notes in the themes have been omitted.

I1A is an especially potent theme in that its contents serve as the source for several other themes. Its head motif, which consists of a whole tone collection (F-Eb-Db-B-A) with the addition of C, has been remarked on by others.[4] I1A contains the outlines of the three descending semitones (Ab-G-F#) of I1B at the transposition of a major third (C-B-Bb) as well as an inversion of I1B (C-C#-D). In addition I1A contains a retrograde transpostion (Eb-C-B) of I1C (E-F-Ab). These relations are shown in examples 6a and 6b. Finally I1A shares certain features with I1A-closing which are illustrated in example 7a. These include an opening based on five notes of the same whole-tone collection (G-F-Eb-Db-B-A) followed by a non-

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4 Archibald, Harmony in the Early Works of Alban Berg, 41.; Shirley Meyer Blankenship, Berg Lines: Opus 3: Lyrische Suite (unpublished D.M.A. dissertation University of Illinois at Urbana-Champaign, 1977), 89.; Carner, Alban Berg, 103.; Perle, "Berg's Master Array of the Interval Cycles." The Musical Quarterly, 63/1, 4 and 6.; Hans Redlich, Alban Berg: The Man and His Music (London: John Calder, 1957), 69.; Schweizer, Die Sonatensatzform im Schaffen Alban Bergs, 73.

member pitch, a prominent whole-tone descent through a major third followed by the leap of a major third, and an important descending whole-step. In addition, both themes feature a major third in important positions. I1A ends with a descending major third (D-Bb) and I1A-closing begins with an ascending major third (Eb-G). Thus, all first-theme group material is relatable to I1A.

The Bridge theme also contains, as does I1A, the outlines of I1B inverted (C#-D-D#). It can also be viewed as an expansion of I1C as shown in example 7b with the minor third of I1C (F-Ab) becoming a major third (D-F#) in I Bridge. I designate this as bridge because it lasts for the entire duration of bars 43-47. The Bridge theme is the least important of all the first movement themes. After its initial prominent appearance in the first violin of bars 43-47, the Bridge reappears only in fragmentary form or in an accompanimental role. Other themes (I2A, I2B, and I2C) which are of shorter duration or occur in fragments within these bars are not truly bridge material, but rather are associated with and developed in the second-theme-group.

The five themes of the second group can all be related to themes of the first group. They differ from the themes of the first group in that they do not all relate closely to I1A. I2A outlines the same tritone-plus-a-fourth (Eb-A-E) that I1A-closing does. I2B (Eb-Bb-Fb) outlines the same intervals in a different order--total span of a perfect fifth with a semitone articulated above its lower pitch--as I1A. In addition both the head of I1A (F-Eb-Db-A-C-B) and all five pitches of I2B (Eb-Bb-Ab-Gb-Fb) share the attribute of having all but one pitch belong to the same whole-tone collection. I2C is

primarily relatable to I1C since both outline an ascending minor third. In addition to this relationship I2C can be in part inversionally related to I2B. I2B leaps upwards by a perfect fifth while I2C leaps down a perfect fifth. Both themes then continue in cycles in directions opposite their leaps, but the cycles are not of the same interval. I2D (Bb-A-Eb) outlines the same chord, transposed by a tritone, as does I1A-closing (Eb-A-E) and I2A (Eb-A-E). I2D also shares the attribute of the head of I1A and all of I2B in that all but one of its pitches (A-Bb-B-F-Eb) belong to the same whole-tone collection. I2E contains a transposition of I1B (Ab-G-F#) in its cycle of descending semitones (E-Eb-D). Given the complexity of the thematic relations within the first movement alone, it is not surprising that most analyses have dealt almost exclusively with this aspect of Opus 3.[5]

In a traditional sonata-form movement themes of a particular group would share the same key. In Opus 3/I it does not seem

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[5] An exception to this is a dissertation in progress at Princeton University by Jody Rockmaker, The role of pitch in the articulation of form: Alban Berg's String Quartet, Opus 3 and its sketches. Based on a preliminary paper delivered by Rockmaker at the Society for Music Theory meeting in Rochester, NY in November of 1987, Rockmaker's analysis does not utilize interval cycles or symmetrical formations as does this paper but rather attempts to find principal pitches. These are used as tonal centers and they, and the linear motion between them, are graphed in a Schenkerian manner. Rockmaker relates his analytical ideas to his analysis of the skeches of Opus 3. For me the most exciting aspect of his work is his discovery of earlier versions of passages of Opus 3 beneath pasteovers in the sketches. The catalogue of all the Opus 3 sketches in his dissertation will be the first detailed account of these materials.

possible to distinguish any evident harmonic criteria, such as a referential collection, by which themes of the first and second groups are differentiated. Themes of the same group instead have become identified with each other through their repeated association. I have shown how themes of the first group all relate to I1A. I have also shown how themes of the second group, rather than all relating directly to I1A, are instead each related to a particular theme of the first group and so become a kind of third generation. Beyond these factors, which are far from immediately evident, it is only by their initial and repeated association that the themes of a group become identifiable as such.

There are three different ways that Berg manipulates first movement themes that are out of the ordinary. The first of these occurs in the first violin in bars 10-13. Example 8a illustrates how Berg uses each pitch of the first statment of I1C (E-F-Ab) to generate the transpositions of I1C that follow.

Example 8b illustrates the second violin of bars 95-100. Here four notes (C-D-F-Bb) of I2E have embedded within their framework their own minor third transposition (Eb-F-G#) and three statements of five-note segments of the approximate inversion of I2E (F-Eb-Bb-G-F#; G-F-D-A-G#; A-G-Eb-B-A#).[6]

The third special kind of thematic manipulation is a subtractive process. Bars 77-81 of the first violin find Berg using

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[6] For a discussion of techniques that relate to those in examples 8a and 8b see "Cantus Firmus Techniques in the Concertos and Operas of Alban Berg" by Douglass M. Green in Alban Berg Symposium Wien 1980 Tagungsbericht (Wien: Universal Edition, 1981), 56-68.

this process on the inversion of I2E. In each of the first three of its transposed occurrences an additional note is cut from its beginning. This disintegration serves as a way in which to close the section. It is also found at the end of the recapitulation in the first violin of bars 178-179. The instance from the exposition is shown in example 9a. Here line A quotes the first violin part and line B aligned below shows the subtracted pitches in parentheses. Intervals of phrase transposition are shown below. The subtractive pattern is broken in the fourth statement of the theme since only two notes instead of the expected three are cut and the first note is retained. Line C shows the primary tones of the passage. The basic motion of this inverted form of I2E is a semitone upwards (+1). The numbers other than +1 show the distance of each new transposition from the last pitch of the previous one. Line D continues the transposition pattern suggested by the first two transpositions, +4 and +3, of line C. The result of line D is the discovery that the initial pitch level is again arrived at through this pattern. Apparently Berg did not desire this and so broke both his subtractive pattern and his transpositional pattern simultaneously at this point.

It is interesting to compare this passage with the parallel passage, bars 178-179 of the first violin, in the recapitulation-coda. This passage is shown in example 9b. It can be seen in line B that the subtractive pattern is not broken off as it is in example 9a and that the final statement of the fragment consists of only two pitches, D and C#. The transpositions are not the same as in the exposition example. Line C shows that there is no clear interval pattern to the basic motion in this passage. These parallel passages

in which Berg employs the subtractive process have a certain formal significance which will be discussed in the next chapter.

Chapter IV

FIRST MOVEMENT FORMAL DIVISIONS

The first movement of Alban Berg's Opus 3 String Quartet is a sonata-form movement. The movements's formal divisions are as follows:

Exposition:	First-theme-group mm. 1-40 Bridge mm. 41-47(through fermata) Second-theme-group mm. 47(last eighth note)-80
Development	mm. 81-104
Recapitulation	First-theme-group mm. 105-137 Second-theme-group mm. 138-152
Coda	First-theme-group material mm. 153-157 Second-theme-group material mm. 158-168 First-theme-group material mm. 169-176 Second-theme-group material mm. 177-179 First-theme material mm. 180-187

These divisions are based on thematic content but will be seen presently to be supported by Berg's use of interval cycles.[1] In

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[1] Theodore Adorno (Alban Berg. Wissenschaft und Kunst, Wein 1968, 69) and Schweizer (Die Sonatensatzform im Schaffen Alban Bergs, 79.) agree with all these divisions. The only division on which there is disagreement is that of the coda. Where exactly does its begin? Adorno, Schweizer, Samson (Music in Transition, 163) and Carner (Alban Berg, 105) put the coda at bar 153. Archibald (Harmony in the Early Works of Alban Berg, page 28 of Examples volume) puts it at bar 177. I don't understand this choice. Rockmaker (The role of pitch in the articulation of form: Alban Berg's String Quartet, Opus 3 and its sketches, page 1 of examples) puts it at bar 180 and draws

addition many of these divisions are further confirmed by tempo changes. These descriptions of thematic content are, of course, general. Further detailed description of proportion and thematic content now follows.

The following is a sectional breakdown of the movement with the thematic contents of each section listed. The most important themes of each section are underlined. In many cases themes not underlined occur only once in the division or only in a variant or fragmentary form.

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his support from the parallel of the closing exposition bars 77-80 with bars 177-179. This parallel is certainly there. However the use of the "am steg" staccato passage, whose transitional positioning I discuss in the conclusion of this chapter, and the return of I1A in its original register in 156-57 are for me the stronger indicators of the coda beginning at bar 153. Berg, while he used Classical sonata-form as a reference, does not exactly follow the traditional Classical recapitulation formula. Instead he finds his own solution by presenting in the coda the elements of the exposition he has not paralleled in the recapitulation. I also seriously considered bar 169 as beginning the coda since the cello B is an important deep background pitch as shown in Graph I, but decided that bar 153 was the better choice.

Exposition	First-theme-group mm. 1-40 [I1A, I1B, I1A Closing, I1C] Bridge mm. 41-47(through fermata) [I Bridge, I2A, I2B fragment, I2C fragment] Second-theme-group mm. 47(last eighth note)-80 [I2B, I2C, I1C, I1B, I2D, I2E, I Bridge]
Development	mm. 81-89 [I1B, I1A, I2E] mm. 90-97 [I2D head, I1A tail, I2E] mm. 98-104 [I2D tail, I2E, I1A tail]
Recapitulation	First-theme-group mm. 105-137 [I1A, I1B, I2A, I1A Closing, I Bridge, I1C, I2C] [2] Second-theme-group mm. 138-152 [I2D head, I2A tail, I2B, I2C, I1B]
Coda	First-theme-group material mm. 153-157 [I1B, I1A, I1A Closing] Second-theme group material mm. 158-168 [I2E, I2B, I1B] First-theme-group material mm. 169-176 [I1A, I1B, I1C, I2B variant, I2A variant] Second-theme-group material mm. 177-179 [I2E] First-theme material mm. 180-187 [I1A, I1B, I1C]

The exposition is evenly divided between the first-theme-group of forty bars and the combination of bridge and the second-

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[2] Mark DeVoto (at the joint AMS-SMT National Meeting in Baltimore, MD, on November 4, 1988) pointed out that bars 126-131 are derived from Berg's unfinished Fifth Piano Sonata. A facsimile of the Fifth Piano Sonata can be found in Rosemary Hilmar's "Alban Berg's Studies with Schoenberg," Journal of the Arnold Schoenberg Institute, VIII/1 (June 1984), 22-26. The bars that correspond to 126-131 are found on the third page of the sonata (page 24 of Hilmar's article). They consist of the upbeat of the third bar through the downbeat of the eighth bar of this page.

theme-group of forty bars. There is justification in considering the bridge part of the second-theme-group in that it contains I2A and fragments of I2B and I2C. It contains no themes from the first-theme-group. It also makes sense to count bars in this movement since there is no change of meter throughout the movement. It is not clock time that is being considered in this discussion (therefore tempo changes do not apply to these calculations) but rather, through counting measures, it is the number of beats in each section (since all bars have two beats) that are being compared. The eighty bars of the exposition and the eighty-three bars of the recapitulation-coda are almost equal. However, the recapitulation-coda contains fifty-four bars of first-theme-group material presented in four different installments which have between them three installments of second-theme material. These installments of second-theme material total twenty-nine bars. There are almost twice as many bars of first-theme-group as second-theme-group in the recapitulation-coda whereas in the exposition the two theme groups were given equal exposure. The development's twenty-four bars deal almost exclusively with second-theme-group material. The total of these twenty-four bars and the twenty-nine bars of the second-theme material in the recapitulation-coda is fifty-three bars. This total almost equals the fifty-four bars of first-theme-group material of the recapitulation-coda. If the last bar of the movement is discounted as simply an extra bar that sustains the final chord, then the total number of bars for the first-theme group (fifty-three bars) and the second-theme group (fifty-three bars) are equal in the combination of development with recapitulation-coda.

If these totals are then added to the totals of the exposition it is discovered that the total number of bars of first-theme group material, ninety-three bars, equals the total number of bars of second-theme-group material for the entire movement! These calculations can be summarized in the following manner:

Exposition:	theme group 1	40 bars	Bridge	7 bars
			theme group 2	33 bars
	total	40 bars	total	40 bars

Development:			group 2	24 bars
Recap.-coda:	group 1	33 bars	group 2	15 bars
	group 1	5 bars	group 2	11 bars
	group 1	8 bars	group 2	3 bars
	group 1	8 bars		
	theme group 1 total	54 bars	theme group 2 total	53 bars
		-1 sustaining bar		
	total	53 bars	total	53 bars
		±40 bars Exposition		±40 bars Exposition
movement total:		93 bars theme group 1		93 bars theme group 2

Berg must have carefully calculated these proportions at some early stage in his compositional process.

A comparison of parallel passages in the exposition and the recapitulation-coda further clarifies Berg's formal conception. There are not many of these parallel passages so those that do exist take on greater formal significance. Bars 159-162 (163-164 repeat 161-162) repeat exactly a passage from the exposition bars 60-63 which is a duo between the viola and cello. In the exposition this

passage comes seventeen bars before the end of the section and twelve bars before the subtractive treatment of I2E in bars 77-81 (see example 9a and discussion in Chapter III). In the coda the viola-cello duo occurs eighteen bars before the final first-theme group section of the movement begins at bar 183. It also is twelve bars before the first statement of I2E at bar 177 in the passage where I2E, as is shown in example 9b, is treated subtractively. The parallel placement of these passages--exposition bars 60-63 (viola-cello duo) and bars 77-80 (I2E inversion treated subtractively) as compared to coda bars 159-164 (viola-cello duo) and bars 177-179 (I2E inversion treated subtractively)-- shows that Berg considered the coda to be parallel to the closing elements of the exposition.

Examination of Berg's development and use of the "am steg" staccato passage, which first appears in the cello and viola of the bridge in bars 41-44, provides additional formal clarification. These bars open with Eb and D whose relationship suggests a semitone cycle, which in turn suggests I1B. Berg uses the "am steg" staccatos with I1B in bars 108-110 and extends this pattern further in bars 114-118. Here again the "am steg" passage is in a transitional position, as it was in its original bridge function, coming right after the conclusion of the development. In its last appearance the "am steg" passage is again a transitional element since, again with I1B, it initiates the coda in bars 153-156.

Chapter V

FIRST MOVEMENT GRAPHS

The large number of graphs of the different structural levels of Opus 3 are purely linear analyses. The essential point of the graphs is to show goals of motion in the unfoldings of embedded cycles in each instrument. In Chaper II examples 3a-i demonstrated various compositional treatments of embedded cycles. The kind of analysis done in those examples forms the basis for the graphs of Opus 3. These graphs differ from Schenkerian graphs, which are based on underlying tonic-dominant-tonic harmony and ultimately on an underlying tonic harmony, in that they are not based on any underlying harmony. The graphs show how cycles exist on the local level and also are operating over large expanses. The formal divisions of the two movements will be shown to be articulated by the cycles of longest distance.

The deepest levels of graphing are the cycles of longest distance. In the deeper levels of graphing local cycles are ommited with the result that the cycles of longer distance are more clearly seen. Since cycles of c+5 and c-5 are more often stretched over longer distances than other interval cycles these are always shown with darker beams. Each movement has a fundamental background cycle and the pitches of this cycle are shown with larger rhythmic values. Dashed ties are used to indicate long range voice-leading connections and ties indicate continuation of the same pitch either

through its actually being tied or through its repetition.

Exposition

The upper voice of the opening bars of the movement provides a good example of how Berg embeds his themes, whose component interval cycles have already been discussed in Chapter III, within a larger context of interval cycles. Example 10 provides illustration for the following discussion of bars 1-28. The quartet begins with I1A in the second violin. In bar 2 of this theme B is especially emphasized through its sfz dynamic, its placement on the downbeat, and its long duration. This B functions as a concluding note of the whole-tone collection F-Eb-Db-A-B; it is also further marked by the double neighbor notes, A-C, which precede it. More importantly B is the axis of two inversionally related semitonal cycles. The five-note descending cycle (Db-C-B-Bb-A) concludes in bar 6. The nine-note ascending semitonal cycle commences on the violin II B in bar 2 and concludes on the viola G in bar 14. The Eb in this cycle, found in the first violin of bar 7, is registrally displaced upwards by an octave. Since this semitonal cycle begins on B, concludes on G, and has Eb as its only pitch that is registrally displaced, a c+4 of G-B-Eb can be understood to be embedded within it. These pitches are notated using half notes in example 10.

A closer examination of these bars reveals how carefully Berg wove his themes into this ascending semitonal cycle. Their placement and orchestration will now be shown to further articulate the embedded c-4 (G-B-Eb). The ascending semitonal cycle is distributed between three instruments: violin II, violin I, and viola.

Each instrument articulates a different member of c+4 (G-B-Eb). The second violin opens the work with I1A in which B is so important. I1A-closing is first stated by the first violin as it enters in bar 7. I1A closing begins with the registrally displaced Eb of the ascending semitonal cycle. The viola plays the last note of this cycle, G, which is the first pitch of the first appearance of the inversion of I1C. In summary each of the pitches of the embedded c+4 is prominently associated with a different instrument and the first statement of a different theme.

Other details of the passage also show the care with which themes are worked into the larger context of cycles. The transposed statements of I1C in the first violin bars 10-13 are arranged to highlight E (the first note of I1C in bar 10), F (the first note of I1C in bar 12 as well as being emphasized by its long duration and downbeat placement), and F# (emphasized by its repetition in bar 12) of the ascending semitonal cycle B-C-C#-D-Eb-**E-F-F#**-G. The placement of these transposed statements of I1C also produces an embedded c+3 (F#-A-C-Eb) which is articulated through the parallel rhythmic placement of F#-A in bar 12 and C-Eb in bar 13. The final note of this embedded c+3, Eb, refers back to the registrally displaced Eb in bar 7 which began I1A-closing.

Berg prepares the viola for its arrival on the final G of the ascending semitonal cycle (B-C-C#-D-Eb-E-F-F#-**G**) in bar 14. Example 10 shows how G is actually the final note of the c+5 segment A-D-**G** in the viola part. The example also illustrates how G is simultaneouly used as a member of the c3 collection C#-Bb-E-**G**.

Since the total span of I1C and also of its inversion is a major third, these forms are used to articulate the pitches of the embedded c+4 (G-B-Eb). The final statement of I1C in bar 13 (**B**-C-**Eb**) includes two pitches (B and Eb) of c+4. The viola transposition of the inversion of I1C (**G**-Gb-**Eb**) of bar 14-15, which includes two pitches (G and Eb) of the c+4, also does this.

I will now examine the upper voice of bars 14-28 to look for further evidence of the importance of the pitches of c+4 (G-B-Eb). The viola shifts to the top voice in bars 14-17. We have seen how the inversion of I1C at bar 14 contains two pitches (G and Eb) of the c+4 (G-B-Eb). The concluding viola upper voice pitches in bars 16-17, a transposition of I1C (**G**-Ab-**B**), also have this feature. In both these cases the pitches of c+4 (G-B-Eb) are emphasized by either or both their beginning and concluding placement in the theme and their rhythmic placement and duration.

The upper voice is taken back by the first violin in bars 18-22. A new tempo is reached in the second half of bar 20 after a brief passage composed of expansions of I1C welded to a version of the tail of I1A in bars 18-20. Here the first violin commences with a statement of I1C inverted (**Eb**-D-**B**) that again contains two pitches of c+4 (G-B-Eb). At bar 23 the second violin momentarily takes the top voice with a transposition of I1C inverted (**B**-Bb-**G**) that too contains two pitches of c+4 (G-B-Eb). The initial B of this statement of I1C inverted is the first tone of a longer distance c+2 (**B**-C#-Eb-F). The first violin regains the top voice with the C# of this cycle in bar 24. This C# serves as the initial note of a statement of I1C inverted (**C#**-C-A). Eb in bar 26 serves as the

initial note of an expanded version of I1C inverted (**Eb**-Db-A) which at the same time is a fragment of the head of I1A (F-**Eb**-**Db**-**A**-C-B) that follows. F serves as the initial pitch of the head of I1A that concludes on B in bar 28. This B, a pitch of c+4 (G-B-Eb) is emphasized in all the same ways, dynamically, durationally, and rhythmically, that it was in the first appearance of I1A in bar 2.

The previous paragraphs have established the importance of c+4 (G-B-Eb) in the upper voice of bars 1-28. They have shown how the pitches of this cyle are emphasized through particular transpositions of themes, orchestration, rhythm, register, and their use as common tones or axis tones for two or more cycles. These pitches also have priority in the lowest voice. The bass note G and the soprano note B are actually the most important pitches in the first movement. They can be seen in their outside registral positions in the opening of the movement in bar 2 of the second violin and in bar 3 of the cello (G here concludes a three-note segment of c-5 [F-C-**G**]). They are also found in the same positions in the final chord of the movement. In addition both return with great emphasis at the beginning of the recapitulation at bar 105. Graph I of the deep background level illustrates this c4 (G-B-Eb) as the deepest structural level of the movement. I shall term this the fundamental interval cycle.

Other examples of the pitches of the fundamental interval cycle (G-B-Eb) being important in the lowest voice will now be presented. At bar 22 two interval-5 cycles of opposite direction commence on the cello B, which serves as an initiating axis. This is shown in Graph III of the middleground. C+5 (**B**-E-A-D-**G**) moves to

G in bar 38 and c-5 (**B**-F#-C#-G#-**Eb**) moves to Eb for the opening of the second-theme-group at bar 41. The second-theme-group of the exposition is also of particular interest since it contains the convergence of four different interval cycles (c+5: F-Bb-Eb-G#-C#-F#-**B**)(a local c-4: G-Eb-**B**)(c-3: G#-F-D-**B**)(c-1: E-Eb-D-Db-C-**B**) on the cello B of bar 80. This passage was discussed in Chapter II and is shown in example 3i. The cello B, which is a member of the fundamental interval cycle, initiates the development.

Development

Since I have established Berg's manner of embedding themes within a larger context of interval cycles in the discussion of the exposition, the discussion of the development and recapitulation-coda will primarily focus on the use of cycles in the middleground. These will be related, when appropriate, to the fundamental interval cycle (G-B-Eb). The development is the most complicated section of the movement. The dense contrapuntal interweaving of I2E in both its prime and inverted forms in bars 81-89 serves to make the middleground cycles less obvious. In addition cycles are traded between instruments. Because of this complexity an extra level of graphing, Graph VA Development Foreground reduction, is included. In this graph the less important notes of themes are not shown in order to make the middleground cycles more apparent. This graph overlaps both the exposition and the recapitulation in order to show their connections to the development.

Middleground Graph III shows that the soprano of the development is essentially a long distance c-2 (E-D-C). The space between its D in bar 82 and its C in bars 94-95 is very elaborately filled. In bars 84-86 the c3 collection D-B-G#-F is articulated through fp dynamics and double-stop octaves in the upper three instruments. The cello provides F of the collection in bar 85 which is emphasized by its downbeat placement and duration. At bar 86 the second violin takes the highest voice with Ab of this collection. Ab is prominent through its register, duration, and function as the intial tone of an extended c+1 (**Ab**-A-Bb-B-C-C#-D-D#-E-F-F#-G-Ab-A-Bb-B-**C**) whose last tone is also the final C of the long distance c-2. There is a second shorter ascent to C (G-Ab-A-Bb-B-**C**) in bars 96-98 that again concludes on this same C. C is also further sustained in the c-4 of bar 99 (**C**-Ab-E-**C**). Both ascents to C linger on G, a member of the fundemental background cycle 4 (**G**-B-Eb), and in addition to lingering on it also registrally displace it. These devices make it apparent that Berg still regards G as important even in the complicated context of the development.

As C is reached in bar 98, I2A is introduced as a vehicle for descending through three octaves. The first violin statement of I2A in bars 98-99 is a variant form constructed to outline c-4 of C-Ab-E-C. All other statements of I2A are variants of its tail of descending semitones. In addition there is a preoccupation with Eb as the first pitch of a repeated c-1 segment (Eb-D-Db-C) in the first violin in bars 100-103. Eb leads back to B thus again articulating tones of the fundamental cycle (G-**B**-**Eb**). B is first present in the first violin of bar 103, is transferred down an octave in bar 105, and

appears another octave down in the second violin of bar 106. In this last appearance it is a component of I1A which clearly begins the recapitulation by paralleling exposition bars 1-3 of the second violin.

Graph VA reveals that both ascents to C are set against ascending interval-4 cycles which begin on A (A-C#-F-A), as seen in bars 90-94 of the second violin and bars 97-100 of the cello. This suggests that Berg regarded the second ascent to C to be a shortened and intensified reiteration of the first.

Bass B in bar 81 continues the c+5 (F-Bb-Eb-G#-C#-F#-**B**-E-A-D-**G**), which began in bar 64 of the exposition, through the development. Its last pitch in the development is G, which like B is a member of the fundamental interval cycle (**G**-**B**-Eb). This G is first reached in the cello of bar 95 and serves simultaneously as a member of c+5, the initial tone of c-5 (**G**-D-A-E-B-F#) on the middleground level, and also as a member of c-5 (F-C-**G**) on the foreground level of the section. C+1 (A-Bb-B-C-C#-D-Eb-E-F-F#-**G**) is embedded within the c+5 and it too, in bar 96, concludes on G. Two three-note interval-2 segments (**D#**-F-**G**; **G**-F-**Eb**) in cello bars 83-87 also articulate, through their outside placement in the segments, the notes of the fundamental cycle. The use, in bars 96-100, of a c2 collection in the cello (D-C-E-Ab-F#-E-Ab) gives a special emphasis at bar 101 to the cello B, a member of the fundamental c4 (G-**B**-Eb) but not a member of this c2 collection. This B moves rapidly to G of the fundamental interval-4 cycle to close the section.

The thematic content of the development deserves additional comment. There is one appearance of the head of I1A (bar 83 of the viola) in the development. Here the head of I1A is altered in two ways. First, while the whole-tone-collection-plus-one-tone content of the original is preserved the theme (D-C-G#-Bb-A) has been intervalically altered. Secondly, it is missing its first tone, E. Probably Berg still has in mind the subtractive procedure he has just finished performing on I2E (see example 9a). However, this missing E can be understood to be present, in a distant sense, either from the octave displaced viola E of bar 82 or from the prominent first violin E, which is in the proper register, on the downbeat of bar 81.

The sole preoccupation with I2E in bars 81-89 and its reappearance in bars 94-98 in conjunction with I2A (see Graph VB) can be explained by the fact that both these themes contain prominent perfect fourths. These fourths are transferred to the lower instruments and eventually lead into the cello c-5, F-C-G, the same cello segment that appears at the opening of the movement. This is shown in Graph VB commencing with the viola B at bar 99. Here the viola's c-5 (B-F#-C#-G#-Eb) is continued in bar 102 by the cello's c-5 (Bb-F-C-G) and concludes on fundamental bass G. Berg relates the tail of I1A with the head of I2D in bars 90-94 in the same way he related I2E and I2A: through the common intervalic content of an initial semitone.

The first 3 notes (Bb-C-Eb) of the second violin in bars 81-82 are taken from this theme. They are heard again in the same instrument in bars 83-84. This second statement adds the fourth note, a G# in an octave, to the first three of I2E. This appearance of

I2E in an eighth-note rhythm at the same time that I2E appears in the first violin in bar 81, Eb-F-Ab-Db, in thirty-second notes suggests that Berg is concerned with rhythmic augmentation and diminution. This is confirmed when I2E appears in sixteenth notes, Bb-C-Eb-Ab-A, in the cello of bar 87. Another kind of working of this theme has been shown in example 8b where the notes of I2E have long range voice-leading implications.

Recapitulation

The prominent appearance in the recapitulation of interval-3 cycles is of interest since interval-3 cycles do not play important roles in either the exposition or the development. Example 2b demonstrates that each of the three interval-3 cycles contains only one pitch of the fundamental interval-4 cycle (G-B-Eb). An interval-3 cycle is therefore useful as a means of emphasizing this one pitch and as a means of getting from one octave to another. This is specifically done in bars 121-132 where B of the fundamental c4 (G-B-Eb) is emphasized and c-3 is used to move it down an octave. Graph III shows how B is displaced up an octave at bar 121 and then through a descending interval-3 cycle (B-Ab-F-D-B) regains its original register at bar 132.

Graph III reveals that another c3 collection (Bb-C#-E-G) governs the soprano in bars 134-149. A detailed account of its articulation follows. In bar 134 the viola, which has the top voice, begins an inverted statement of I1C with Bb. Against this, to confirm the importance of this c3 collection, the cello plays a

transposition of the head of I1A that begins with Db and concludes with G. In bar 136 the first violin begins its phrase with a registrally prominent Bb. Against this Bb, again as confirmation of the c3 collection, the viola plays a transposition of the head of I1A which begins with G and ends with C#. The first violin continues with arrivals on E in bar 137 and G in 138. This G is the highest pitch of the passage. The version of I2A that concludes the passage ends with E in bar 140. G is emphasized in I2D in the first violin in bar 142 through its transfer upwards three octaves. It leads to Bb in bars 143-145 which is prominent through its constant repetition and extreme register. G and Bb are found in the same context in successive uppervoice statements of I2D. These occur in the viola bars 145-146, the second violin bars 147-148, and the viola bars 148-149. In bar 149 the cello, again to confirm the importance of this c3 collection, plays a version of I2C which also emphasizes C#, G, and Bb.

The bass of the recapitulation articulates the third c3 collection (C-Eb-F#-A) in bars 112-123 as is shown in Graph III. Graph VI illustrates the following discussion. In bar 112 the cello plays I1A-closing whose first slurred segment begins with Eb and ends with A. Bars 114-119 repeat the second slurred segment of I1A emphasizing F# through its longer duration, downbeat placement, and louder dynamic. The priority of F# is confirmed at bar 119 where it concludes the presence of I1A-closing and is sustained through the entire bar. In bar 120 the cello begins a new theme, I1A, which immediately moves to Eb on the downbeat of bar 121. C of bar 123 is prominent through its downbeat placement and

low register. It is transferred up one octave to become the first note of a transposition of the head of I1A which concludes with F#.

The bass of the recapitulation in bars 123-134 consists of two interlocking ascending interval-5 cycles a tritone apart. These have their beginning in the opening and concluding pitches, C and F#, of the head of I1A in bar 123.

Graph III shows how both soprano and bass articulate the pitches of the fundamental cycle (G-B-Eb). The soprano B and bass G that begin the section have been previously mentioned. At bar 121 the soprano again sounds B but this time it is supported by a bass Eb. Both of these pitches are emphasizd by their downbeat placement and low reister. The first violin immediately transfers B up one octave as the concluding pitch of the head of I1A. The priority of Eb in the bass is confirmed in bar 125, where it is the highest pitch of the passage of repeated statements of the head of I1A (bars 123-125). Eb also appears on the downbeat of bar 130 where the cello begins new material.

Coda

Graph III illustrates that the soprano articulates the c3 collection (C-Eb-F#-A) in the coda with A and C receiving the greatest emphasis. In bars 153-156 the notes of this collection are found in either beginning or ending positions of successive topline I1B transpositions. This can be seen in Graph VI which illustrates the following detailed discussion. Eb opens and A concludes I1a-closing in bar 156. In bars 164-165 the viola F# and the second

violin A initiate a rising fifth motive. C is strongly emphasized by its downbeat placement in every bar of 166-171. Its registral transference through three octaves is mimiced by those of D in bars 177-182.

The arrival at the final soprano B in bar 183 is accomplished through its membership in the middleground c-3 (Ab-F-D-B) which begins at bar 173. A detailed account of these pitches follows (see Graph VI). The importance of Ab becomes clear in bar 174 where it initiates a transposition of the head of I1a. F is found in both violin I and violin II of bars 175-176. It is prominent through its repetition, coordination with ritards, and its role as the highest note of its slurred segment. It also is the final note of a local c-1. D is first expressed in the second violin at bar 177 as the first and last note of a variant of I2E. D is transferred to the first violin in bar 178 where it is the last note of the first fragment of I2E and the first note of the second fragment of I2E. D is transferred through three octaves in bars 180-181. The final B is also transferred upwards through three octaves.

The bass approach to G of the fundamental cycle (G-B-Eb) is intricate. The bass line from bar 153 to the end is essentially a c-1 (see Graph III). Berg articulates the fundamental interval-4 cycle within this interval-1 cycle in the following manner. B is the final pitch of the original transposition of the head of I1A in both bar 164, where it is also part of c-1, and in 172, where it is not. At bar 180 an interval-5 cycle descends from Eb. Eb, a member of the fundamental cycle, is emphasized through its registral displacement of three octaves.

Background levels

Graph II illustrates a special aspect of I1B: it is different from all the other themes, since it is actually a descending interval-1 cycle (Ab-G-F#) in itself. I1B appears not only on the surface of the work, but is also important on deeper levels. The deepest of these can be seen on Graph II beamed as eighth notes. A transposition of I1B, B-Bb-A, is found in every register of the soprano and is stretched over very long distance in the highest three registers. I1B echoes are also found in the bass G-F#-F and B-Bb-A.

C is the only non-member of the B whole-tone collection in the initial appearance of the head of I1A, allowing it to function as a kind of dissonant neighbor to B with reference to the entire B whole-tone collection. The dissonant neighbor relationship of C to B is present on a larger level of structure. In the soprano of Graph II it can be seen that C is almost always present before B of the fundamental interval-4 cycle. This is shown by the unstemmed quarter notes in the graph. The durational and registral emphasis given to C in bars 99-104 of the development and bars 165-169 of the recapitulation can be explained by saying that here C functions as a prolonged dissonant neighbor to B on the background level of structure. In considering the dissonant neighbor function of C to the B of I1B (B-Bb-A) it should be understood that B and A belong to the whole-tone collection (G-A-B-C#-Eb-F) which contains the fundamental c4 (G-B-Eb). The use of C as a dissonant neighbor in the

top voice opening is imitated in the use of Ab as a dissonant neighbor to G in bar 10. Ab, like C, is also dissonant to the B whole-tone collection.

Deep background Graph I illustrates how the soprano of the first-theme group of the exposition establishes B as a primary pitch and also outlines the fundamental interval-4 cycle of B-G-Eb-B. In the following sections of the movement B is displaced upwards through four octaves and returns firmly to its initial register only in the coda.

Graph I also shows how the three pitches (G-B-Eb) of the fundamental cycle are used in the bass to articulate important divisions within the sonata-form movement. The first-theme-group of the exposition is supported by a bass G, the second- theme-group of the exposition by a bass Eb, and the development by a bass B. The recapitulation brings the return of the bass G which concludes the movement.

Assuming the desirability of beginning and ending on the same pitch, let us consider the formal possibilities of interval cycles other than c4 in articulating a sonata-form movement through the use of a fundamental interval cycle in the bass. Cycles of 1 and 5 generate all twelve tones before returning to the initial tone and so produce too many pitches to be of use. An interval-2 cycle produces six pitches which are still too many. An interval-6 cycle produces only two which are too few. An interval-3 cycle produces four pitches which could conceivably be used in a scheme similar to that of Opus 3/I. However, this would necessitate a false recapitulation (for example Exposition first-theme-group supported by bass G,

second-theme-group with bass Bb/Development supported by bass C#/False recapitulation supported by bass E, Recapitulation supported by bass G) or incorporation of two fundamental bass pitches into the development (Exposition theme group 1 supported by bass G, theme group 2 supported by bass Bb/Development supported by bass C#- E/Recapitulation supported by bass G). These possibilities are illustrated in example 11. It becomes apparent that Berg chose the most obvious and natural cycle to project a sonata-form movement. The interval-4 cycle is also richer in connections to other cycles than an interval-3 cycle. All pitches of a cycle 4 commencing on G (G-B-Eb) are contained in cycles 1 (**G**-G#-A-A#-**B**-C-C#-D-**D#**-E-F-F#), 2 (**G**-A-**B**-C#-**D#**-F), and 5 (**G**-C-F-Bb-**Eb**-Ab-Db-Gb-**B**-E-A-D) commencing on the same pitch. Given the same situation the interval-3 cycle (G-Bb-C#-G) is only contained within cycles 1 and 5. The interval-3 cycle does have a connection with the interval-6 cycle (**G-C#**) that interval-4 cycle doesn't have, but this is of very limited use since the interval-6 cycle contains only two pitches.

Chapter VI

SECOND MOVEMENT THEMES AND THEIR RELATIONS TO THOSE OF THE FIRST MOVEMENT

In view of the thematic complexities of the first movement let us turn to the issue of thematic connections within the work as a whole. There are two important points to be made in this regard. First, the cyclic nature of Berg's themes in both movements allows them to be embedded into a larger context of cycles. Secondly, Berg demonstrates, by deriving second movement themes from first movement themes, that he has conceived of the two movements as being tightly bound within a single work, rather than two separate, contrasting movements. An additional thematic connection between the two movements is based on the return of I1A in the second movement. This return is discussed in Chapter VIII.

There is a bar numbering error in the printed score of this movement. The bar numbered 30 in the score is actually bar 31. In this paper I have correctly numbered all examples, graphs, and discussion so the reader should remember to add one to all bar numbers in the score beginning with bar 30.

The eight themes of the second movement are shown in example 12.[1] This example also includes a melody that foreshadows

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[1] Archibald (Harmony in the Early Works of Alban Berg, examples volume, 31) gives a more complete roster of second movement themes than any other source. I disagree with his designations in several instances. Archibald sees my IID and IIE as together constituting a single theme. He identifies my IIG but adds to it the

IIC and several variants of the head motif of IIH. IIH and these variants have in common the prominent use of a descending half-step.

Example 13 illustrates the cyclic-interval content of each of the second movement themes. IIA, the most important and lengthy theme of the movement, contains a variety of cycles. In example 13 IIA ex. a shows how the first three pitches of the theme begin the c-1 which stretches throughout its length. The third note, F#, connects with F# in the second bar. This F# and the following F, E and D, are all rhythmically on the beat and the entire segment, F#-F-E-Eb-D, forms a lower voice in this theme. Two c+1 segments of identical pitch content, C#-D-Eb-E-F, are also present in IIA. The first appears in contiguous pitches. The last four pitches of the second (F-E-Eb-D) form the upper register in bars 2-3. In ex. c of IIA these two c-1 segments are shown to begin and end with notes of the interval-4 collection C#-F-A. This collection is explicitly stated by the first three pitches of bar 2. A, the fourth note of IIA, also belongs to this collection and is prominent through the leap downwards that approaches it and by its being the first note of its slurred segment. The example shows how this A also initiates the

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first two pitches (C-B) of my IIH. He identifies the tail of my IIH as being a theme in itself and leaves the third and fourth notes of my IIH (F-Gb) unaccounted for. He designates the violin I material of bars 55-61 as an important separate theme. I see this material as being a variant of IIH. The prominent use of half-steps in these bars relates to the head of IIH and the four-note figure (D-F#-F-Eb) of bar 57 seems to me to be a variant of the first four pitches (C-E-D-Bb) of the tail of IIH.

c-5 segment A-E-B-F# whose first three notes begin successive slurs. The cyclic-interval content of IIA, which in Chapter XI will be shown to be most important, is shown in ex. b. Pitches of the c3 collection D-F-Ab-B begin and end IIA. Additionally D appears on the beat in bar 1 and F occurs on the downbeat of both bars 2 and 3. The articulation of the c3 collection C-Eb-F#-A was previously discussed in Chapter II in conjunction with example 3a.

IIB also contains a variety of cyclic interval segments. The c2 collection whose pitches predominate is shown in ex. a. C-4, G-Eb-B-G, which is articulated by the contour of IIB, is shown in ex. b. IIB opens with G-Eb. B is the final pitch of the following c+1 (A-Bb-B). The concluding G of this c-4 is rhythmically on the beat and is left by a melodic leap. The two c+1 segments shown in ex. b both begin with pitches (A and F#) of the c3 collection (C-Eb-F#-A) illustrated in example c. The other three pitches of this collection all are articulated by either being approached or departed from by a melodic leap.

The intercalation of c-1 and c+1 in IIC is quite obvious. The first five tones of IIC all belong to the same whole-tone collection. The theme that foreshadows IIC is framed by c+1, B-C-Db-D. The other cyclic segments, which are embedded into this frame, are all quite clearly articulated by contiguous pitches. IID consists of the c-4, F#-D-Bb, whose first two pitches bound a c-2 segment and whose last initiates c-1, Bb-A-Ab. Each pitch of c-1, F#-F-E, inititates a new slurred segment. In IIE c+3, B-D-F, is stressed the longer duration of B and D. IIF begins and ends with clear statements of three-note cyclic segments. The middle note of each

of these segments (F-C-G and G#-F#-E) belongs to the same c3 collection (C-Eb-F#-A) as the central pitches (F# and A) of IIF. IIG is framed by c+5, F#-B-E, in which a c-1 is embedded. IIH is framed by c+5, C-F-Bb-Eb, in which a whole-tone collection is embedded.

Example 14 is a family tree of thematic relationships that includes themes of both movements.[2] IIA is at its conceptual center although not actually so placed on the page. The first three pitches of IIA (Ab-G-F#) are those of I1B and the fourth through sixth pitches of IIA (A-Bb-C#) are a transposition of I1C (E-F-Ab). I1B and I1C are shown above IIA in example 14a. A possible connection

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[2] Many of these connections between themes have been pointed out by others. The most complete job has been by Schwiezer (Die Sonatensatzform im Schaffen Alban Bergs, 78-85). Schwiezer connects the head motif of I1A to the first four notes of the second bar of IIA. As I indicate I am not certain about this connection. Curiously Schwiezer does not show that I1B and I1C are used to form the opening of IIA, a fact that seems much more obvious than the possible connection of I1A to IIA.

Jarman (The Music of Alban Berg, 32-4) also makes many of the connections between themes shown in my example 13 in his discussion of "cells." I disagree with several details in his analysis. These include his deriving I1C (in his numbering ii of the second and third bars of example 19a, page 33) from a combination of the second violin and viola parts. Berg's overall treatment of the instrumental parts as individual entities makes this interpretation suspect. In Jarman's example 19f he shows in the bass what he calls a variant of the head motif of my I1A. However the last three notes, G-D-C#, actually belong to another theme which I call I2A. Jarman says of his example 20e on page 34 that it is based on a whole-tone cell. It seems to me more importantly to be based on an interval-3 collection of Gb-Eb-A. These are the rhythmically emphasized notes with Gb being the first pitch and A the last of this melody. The whole-tone and semitonal cycles that are also present are really just filling in this c3 collection.

between the first four notes of the second bar of IIA (F-Db-A-B) and the same pitches of the head motif of I1A is shown with question marks.

IIF, which is shown above I1A, is clearly derived from the head motive of I1A. Both share the opening sextuplet rhythm. In addition four of the first six pitches of IIF (C-F#-A-G#) are a transposition down a minor third of parallelly positioned pitches in I1A (Eb-A-C-B). Also both I1A and IIF have the same first pitch, F. A further aspect of the head of I1A and IIF will now be discussed.

I1A, the main theme of the quartet is remarkable in that the six pitches of its head motif have the maximum possible number (five) of three-note or greater segments (with the exception of interval cycle 6 which contains only two pitches) of different interval cycles possible with six notes. The three-note or larger segments of interval cycles that can be constructed from the pitch content of the head motif of I1A include: c-1 (Db-C-B), c-2 (F-Eb-Db-B-A), c-3 (Eb-C-A), c-4 (F-Db-A), and c6 (F-B). Thus all classes of interval cycles except cycle 5 are represented.

This missing interval-5 cycle segment is supplied in the second movement in the new version of the head motif of I1A, IIF. The first six pitches of IIF can be used to form three-note cyclic segments of intervals 1 (F#-G-G#), 2 (F-G-A), 3 (C-A-F#), 5 (F-C-G), and a complete interval-6 cycle (C-F#). IIF therefore contains three pitches of an interval-5 cycle, the only kind of interval cycle segment that can not be built out of the head motif of I1A, and lacks the pitches to form an interval-4 segment. If the seventh and final note, E, of IIF is considered, it makes the formation of an interval-4

cycle (C-G#-E) possible. Thus, from the seven different pitches of IIF, it is possible to construct three-note segments of interval cycles of all the interval cycles. In order for the head motif of I1A to contain the same cyclic possibilities an additional seventh pitch, G or Bb, would be required. Both of these would allow the formation of the missing interval-5 cyclic segment (F-C-G or Bb-F-C). While neither of these pitches are actually the seventh new pitch of I1A it perhaps is significant that Bb is the final pitch of I1A (see movement I, violin II, bar 5). The manner in which IIF provides what is missing in the head of I1A suggests that Berg considered the second movement to be a kind of completion of the first and thereby implies a tight formal bond between the movements.

IID, shown in example 14a below IIA, is a variant of the opening six pitches of IIA. It changes the intervallic structures--half-steps in IIA (Ab-G-F#) become whole steps in IID (F#-E-D)--but maintains the contour of IIA's first six tones. I1A closing shown below IID is possibly related to it through the common content of a descending interval-2 cycle and a non-literal retrograde inversion. I1A closing is however the definite source for both IIB and IIC. The opening three pitches of both IIB (G-Eb-A) and IIC (C-Ab-D) are inversionally related to the first three pitches of I1A closing (Eb-G-C#). This inversional relationship is continued differently in IIB and IIC at the fourth and fifth pitches (B-A) of I1A closing as is shown in example 14a. A connection not shown in the example is that IIC shares with I1A and I1A-closing the characteristic that five of its first six pitches belong to the one whole-tone collection.

Example 14a also shows that the tail portions of both I1A and IIA are cyclic sets. This similarity lends further support to the notion that the first four pitches of the second bar of IIA (F-Db-A-B) might be derived from the same four pitches of the head motif of I1A.

The lower left quadrant of example 14a illustrates how IIG relates to both I2A and I2E. Both IIG and I2E contain cycles of intervals 1 and 5.[3] The descending interval-1 cycles in IIG and I2E are transpositions of I1B (Ab-G-F#). Above this the head of IIH is shown to possibly be derived from IIA.

Example 14b shows further relationships of several themes to IIA. IIG is derived from the lower register at the end of IIA. The first six notes of IIE (A-B-C-D-Eb-F) are derived from the upper register at the end of IIA. The remainder of the pitches of IIE vary a great deal throughout the movement (Graph XI). The final three pitches (F-A-E) may have their origin in an expansion in inversion of the first three pitches of IIC (C-Ab-D). The transposed inversion of these pitches (F-A-E) comprises the last three pitches of the tail of IIH (D-Bb-Eb). The opening thirds in the tail of IIH (C-E, D-Bb) probably are related to the thirds (Eb-G, C#-A) of the opening of I1A closing and the thirds (Ab-C, D-F#) of the opening of IIC. Five of the first six pitches of IIB (G-Eb-A-B-F#) are dervied from the same pitches of IIA. These pitches occupy prominent registral and rhythmic positions in IIA.

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[3] These are differentiated in the example by using two different styles of arrow.

While Berg's themes are fascinating in the complexity of their relations, ultimately the unraveling of these relations does not provide great insight into the large-scale structure of the movements. Certainly I1A and IIA have a kind of central importance in the quartet. However the relationships between themes are not simple, but rather are often of a very intricate nature. Themes are constructed and derived in a number of ways and in varying degrees of rigor. The danger for the analyst is that he eventually sees all themes as connected in some way and fails to realize that these relationships, while certainly there, are not straightforward. It is difficult to go beyond recognizing that I1A and IIA are centers of a complex of many varied relations with other themes. Rather than through their derivation or construction, Opus 3 themes instead gain meaning through their employment in conjunction with other themes. The theme groups of the first movement provide a clear example of continued thematic association. On occassion Berg will use the common content of a melodic fragment to link themes. A chain of themes is formed by picking out a new common fragment to form each link. In these kinds of ways thematic relationships are contextually determined through development of the overall fabric. It can be said that the network of relations between Opus 3 themes indicates that Berg sought a tight formal relationship between the two movements.

Chapter VII

SECOND MOVEMENT FORMAL DIVISIONS

The second movement of Opus 3 is a ternary form movement, A-B-A', which is actually a sonata-rondo construction.[1] IIA functions as the rondo theme. Rather than adopt the A-B-A' labeling I will refer to the sections as exposition, development, and recapitulation for the remainder of this paper. The following is an account of the main divisions of the movement. The rondo theme is always given by the first violin except at the very end of the movement where it is taken by the cello. This shift is foreshadowed in the cello echo of IIA of bars 61-63 which is in a formal position

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[1] Jarman (The Music of Alban Berg, 177) notes that this movement "fuses sonata and rondo forms to produce, not a traditional sonata-rondo form, but a movement that can, with equal justification, be analysed as either a 'pure' sonata or a 'pure' rondo structure." He further cites Schweizer (Die Sonatensatzform im Schaffen Alban Bergs , 79) where the movement is analysed in terms of Rondo form, and Archibald (Harmony in the Early Works of Alban Berg, examples volume, 30) where it is analysed in terms of sonata form. I agree with Jarman's assessment with the addendum that Berg's special treatment of the rondo theme (see Examples 15 and 23a) does not fit either 'pure' sonata-form or a 'pure' rondo. There are no disagreements between any of the above analysts as to the divisions of the movement. Adorno (Alban Berg, 69) gives the same divisions which are also my own.

(at the end of the exposition) parallel to that of the final rondo (at the end of the recapitulation).

Exposition (mm. 1-72)

Rondo theme IIA (vi. mm.1-3)

Rondo theme IIA (vi. mm. 48-50) (echoed in cello mm. 61-63)

Development (mm. 73-151)

Recapitulation (mm. 152-207)

Rondo theme IIA (vi. mm. 152-154)

Rondo theme IIA (cello mm. 223-227)

A more detailed accounting of the divisions of this movement now follows. I have chosen to show the exposition and recapitulation in adjacent columns so it is possible to easily see parallel divisions.

Exposition	Recapitulation
Rondo IIA 1-3 IIB 2-3 ostinato D 4-9 and 23-25 IIC 5-8 and 23-34 IID 9-13 and 16-23 IIE 13-15 IIF 25-28	Rondo IIA 152-154 ostinato C-C#-D 155-172 I1A 169-170 I1B 170-172 IIA fragmented 170-177
tremolo chords 35-37	tremolo chords 178-185
IIG 38-39 IIH 38-42	
IB and IIF 43-47	IIB and IIF 186-190
Rondo IIA 48-50 IIH head variant 51-55	IIG 191-194 IIH tail and IIB 195-201
IIH variant 56-61	IIH variant 202-207
	208-210 = extension of 202-207 IIC 210-222
Rondo IIA 61-63 (cello)	Rondo IIA 223-227 (cello)
ostinato D and IIH head variant 64-72	ostinato C-C#-D 228-233 I1A 228-229

Development

ostinato G-D-A 73-78
IIH head variant 74-78
IIH tail 79-88
ostinato E 82-88
IIH head variant 83-88

IID 89-92

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tremolo chords 92-93

IIH head variant 95-103
IIE 102-103

IID 104-112

IIG 112-117

IIF 117-119

IIE 120-132

IIE inversion 133-145

IIH tail inversion 146-151
ostinato A-D-G 149-151

Several points need to be made in relation to the above chart. The reason that there is not much thematic parallelism between the opening bars of the exposition and the opening bars of the recapitulation is because the sections have different functions. The opening of the exposition serves to introduce all the thematic material for the movement. Themes IIA, IIB, IIC, IID, IIE, and IIF are given in bars 1-34; IIG and IIH follow in bars 38-42. The opening of the recapitulation serves a different purpose. Its only thematic

parallel to the exposition is that rondo theme IIA reappears. The opening of the recapitulation is important because it contains the first return in this movement of first-group themes (I1A and I1B) of the first movement. This special aspect of the recapitulation will be discussed in the following chapter.

Rondo IIA, IIB and IIC do not appear in the development. IIC is analagous to the B theme in a conventional sonata-rondo structure (where A is the Rondo) of A-B-A/C/A-B-A. IIC receives a great deal of emphasis in bars 5-8 and 23-34 of the exposition. This emphasis is balanced but not paralleled in the recapitulation through its presence in bars 182-183 and 210-222.

Chapter VIII
THE RELATIONSHIP BETWEEN THE FIRST AND SECOND MOVEMENTS

The complex of relations between themes of the first and second movements was discussed in Chapter VI and illustrated in examples 14a and 14b. The conclusion was drawn that Berg intended through these relations to somehow formally unite the two movements of Opus 3. Additional ways in which Berg unites the two movements will now be shown.

IIA, the rondo theme, is the first theme heard in the second movement and it is the most important one of the movement. Rather than simply repeat this theme at each appropriate formal point Berg instead modifies IIA by progressively shortening it. This is shown in example 15. It has already been shown that IIA contains I1B and I1C (see example 14a). Example 15 illustrates all statements of IIA except the final transposed one which is shown in example 23a. At each appearance of IIA Berg further shortens it until at bar 170 only the notes Ab-G-F# remain, which are, of course, I1B. It is in conjunction with these notes that the head motif of I1A makes its first appearance in the second movement.

It is clear that Berg has not arbitrarily brought back the head motif of the main theme of the first movement. Instead he has carefully prepared for the return of IIA by progressively shortening IIA into I1B. The result of the shortening process is the

reintroduction of the original first movement association of I1A with I1B.

The last system of example 15 is a reduction of the context of the return of I1A. IIA can be seen at bar 170 shortened into I1B. Berg makes this obvious by continuing IIA after bar 170 in a new way. The portion of IIA (A-Bb-C#) that corresponds to a transposition of I1C (E-F-Ab) is missing. However, in bars 172-179 the subsequent notes of IIA (D-Eb-E-F) are stated. Examination of the score will show how elaborately this is done. The missing notes, A-Bb-C#, are present in a theme that is given in bars 155-158. (I have not labled this theme but it has in common with I2C the characteristic of a rising chromatic cycle which leads to a repeated note articulation.) Thus, the piches of I1C are shown as present in this theme at 157-158 where the C# first occurs. By both progressively shortening IIA into I1B at bar 170 and simultaneously continuing IIA after a gap of three pitches Berg is able to show without question that the Ab-G-F# are part of IIA. It is therefore not possible to assert that these pitches are an unrelated return of a first movement theme. Berg is able to have enough of IIA present, through leaving out the three notes of I1C, to imply the shortening process in the context of an almost complete statement of IIA.

The return of I1A has another deeper way of relating the two movements. The final note of the head motif of I1A is B. This B, as previously discussed in Chapter III, is the most important pitch in this theme due to its length, placement on the downbeat, sffz dynamic, and cyclic and collection relations to the previous pitches. I have demonstrated that the fundamental cycle of the first

movement is the interval-4 cycle G-Eb-B. The fundamental cycle of the second movement will be shown to be the interval-3 cycle D-F-Ab-B. The B of the head motif of IA is then the only common tone between the two fundamental cycles. This connection is explicitly made in bar 170 where B is simultaneously used as the final tone of the head motif of I1A and also as part of a violin I-violin II-viola chord of all the notes of the second movement fundamental interval-3 cycle (D-F-Ab-B). This connection is actually inherent in bar 2 of the first movement where B of the head motive of I1A is heard against Ab and F. In the context of bar 170 the cello C#, which originates in bar 165, is a dissonant pedal tone to the fundamental interval-3 cycle D-F-Ab-B. This C# will be further discussed in the following chapter.

The relationship between the two movements has been speculated on and explained in very different ways by different analysts. Douglas Jarman writes:

> The formal ambiguity of the Quartet lies...in the way in which the two movements relate to one another, the second movement, in many respects, representing a reworking of the first movement material. Redlich has suggested that the relationship between the two movements is that of exposition and development section (Redlich, Alban Berg, London, 1957, 50), the sonata structure of the first movement thus forming a part of the larger sonata structure of the work as a whole. Such a relationship between the smaller and larger formal designs of a work is a frequent feature of Berg's music. On the other hand, the String Quartet may also be regarded as the first example of Berg's using the same thematic material to produce two or more quite different movements, a procedure later employed in, amongst other works, the Altenburg Lieder (where the first and last songs of the cycle, though very different, are built of the same basic motivic material) and, in

a different form, in the Chamber Concerto (where "a variation movement of c.9 minutes duration and a broadly sung, extended Adagio' are combined to make a new movement of 'a quite independent tone' (Berg, 'Open letter on the Chamber Concerto' in Reich, Alban Berg, London, 1965).[1]

Mosco Carner writes:

That it (Opus 3) has only two movements is indeed rare in the quartet genre, but there are precedents (opp. 54, 78, 90, and 111) in Beethoven's piano sonatas. Two reasons suggest themselves. One is that the coda of the first movement (mm.153-187) has a pronounced Adagio character and thus may be taken to stand for the slow movement. The other and perhaps more valid one is that the two movements--the first a sonata movement and the second a rondo--are thematically related to one another and complementary in mood so as to form an artistically satisfying whole...It is of course possible to see in the rondo, as Redlich does (Alban Berg, 63), a kind of second movement development of the first movement's expository material. But I am rather inclined to assume with Adorno (Alban Berg, 69) that Berg's aim was to invent variants of this material and treat these completely independently in a rondo movement which only towards the end reveals its connection with the preceding movement.[2]

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1 Jarman, The Music of Alban Berg, 176.

2 Carner, Alban Berg, 102-107.

The idea that the coda of the first movement stands for a slow movement seems wrong. I am not persuaded that a slow movement has any place in the formal conception of the work. I also find no evidence to support Redlich's notion that the two movements are part of a large-scale sonata form scheme for the entire piece. Berg in Opus 3 has composed two movements of contrasting character which most fundamentally are, by virtue of their many levels of relation, interlocking halves of a larger whole.

Chapter IX
SECOND MOVEMENT GRAPHS

The fundamental background cycle for the second movement is the interval-3 cycle D-F-Ab-B. D and Ab are the most important of these four pitches and D ultimately has the greater priority. The manner in which D and Ab and background cycles are articulated in the foreground will now be discussed.

Exposition

Examination of the initial transpositions of second movement themes (example 12) provides support for the importance of Ab and D. In IIA Ab is the first and highest note and D is the last and the lowest. D is also the last note of IIB and is indirectly preceded by a registrally prominent Ab. In IIC D is the last and lowest note. Ab and D are also the second and third notes of IIC occurring in its first bar. In this bar D is the lowest tone, and both Ab and D occur on the beat. D is the last note of the theme that foreshadows IIC. In IID D is the last note of the theme. In IIF G# is the highest note of the theme, the last note of the first phrase, and is placed on the beat. Ab and D will now be traced in the context of the movement.

The movement opens with Ab in the highest register of the first violin. This is followed by G# as the first note of the second violin. In the second violin of bar 3 Ab is again momentarily the

highest voice. The importance of D is first felt in bar 4 where it is played by all four instruments in unison. The ff dynamic level, downbeat placement, its correspondence with a new tempo, and the fact that D is the goal tone (see Graph XI) of c-1 (Ab-G-F#-F-E-Eb-**D**) in the first violin, c+1 (G-Ab-A-Bb-B-C-C#-**D**) in the viola, and a member of a c5 collection (F-C-G-**D**) in the cello all serve to strongly emphasize it. In bars 4-8 D serves as an ostinato which is transferred from first violin to viola. In bar 8 it is marked in the cello by its low register, fff dynamic, placement on the downbeat, long duration, and function as the goal tone of the cello c-1 (Ab-G-F#-F-E-Eb-**D**) of bars 5-8. After this D the cello rapidly ascends through two octaves until it reaches Ab at bar 10. Ab is emphasized through its ff dynamic, high register and subsequent octave transfer down on the third beat, its correspondence to a new tempo and meter, its v articulation, and its function as a goal tone for c+1 (E-F-F#-G-**Ab**) in bars 8-10.

A significant arrival on D in the highest register occurs in the first violin at bar 23. Here D is emphasized by its fff dynamic, its correspondence with a new tempo, its subsequent octave transfer and ostinato role, and its role as a goal tone of the first violin c+1 (A#-B-C-C#-**D**) in bars 21-23.

The first appearance of IIF in bar 25 of the first violin and its repetition an octave lower in bar 26 gives prominence to G#. Bars 29-41 repeat Ab in the first violin gradually transfering it downward through four octaves. In bar 43 the second violin plays IIF which again emphasizes G#. At bar 48 IIA returns on Ab in the first

violin. In the viola of bar 65 and the second violin of bars 67-72 D returns as an ostinato.

Middleground Graph IX illustrates how Berg progresses from the unison D ostinato at bar 4 to the unison ostinato G at bar 73. Since this G ostinato begins the development the progression between D and G is of interest. D of bar 4 is transferred down two octaves by the cello statement of IIC in bars 5-8. The concluding low D of IIC is the initial pitch of bass deep background c-5 (**D**-A-E-B-F#-C#-Ab-Eb-Bb-F-C-**G**) which links the D ostinato to the G ostinato. This deep background c-5 can be seen to have many other formations embedded within it. The most important one is the c-5 (Ab-Eb-Bb-F-C-G-D-A-E-B-F#)which begins with Ab of IIC in bar 5. This cycle essentially parallels the deep background c-5 at the interval of a tritone. This becomes explicite in bars 24-28 where the component notes of both cycles (Db-G, Ab-D, Eb-A) appear simultaneously in cello double stops. These are continued in the cello and rhythmically offset in the viola (Bb-E, F-B, C-F) of bars 27-28. Tracing these parallel interval-5 cycles backwards it can be seen that their source is in the prominent Ab and D of IIC in cello bars 5-8. The contiguous A-Eb and Bb-E of the cello in bar 8 represent these cycles.

Bars 9-23 are the most difficult part of the cyclic pattern to discern. The deep background c-5 reaches E in bar 8. E is registrally displaced and then alternating cycles of interval-1 and interval-2 in bars 9-20 are used to transfer it back down to the appropriate register. The low E in bar 20 is followed by B in bar 21 and F# and C# in bar 22. All these pitches, which form the segment E-B-F#-C#

of background c-5, are the highest and first notes of their phrases. C# of bar 22 is transferred down to Db of the cello double stop in bar 24.

The notes of the upper c-5 cycle continue from Eb-Bb of bar 8 with F in bar 9. A register transfer then takes place through the same alternating interval-1 and interval 2 cycles which were mentioned above. C is reached in bar 19. This is the lowest pitch of the passage and the last of its phrase. The next member of the cycle, G, arrives together with Db in the previously discussed cello double stops. It can also be understood to be foreshadowed in the G which begins both bar and phrase in 21.

The bass upper c-5 can actually be understood to continue through the exposition. Its F# of viola bar 28 is gradually transferred down an octave. This new F# arrives in the cello of bar 50 and is the highest note of the ascending cycle formations of bars 42-50. B at bar 46, which is emphasized by its long duration and downbeat placement, precedes the F#. Thus, B-F# in bar 28 can be understood to be repeated in B at bar 46 and F# at bar 50. Db at bar 50 folows and is transferred up two octaves through phrases which end on C# in bars 53 and 55. C# is further reiterated in bars 60-61. Ab of bar 61 begins IIA which also rhythmically and dynamically articulates Eb and Bb. F arrives on the downbeat of bar 65 and is also present in bars 68 and 69 on downbeats and in the last sixteenth of bar 72.

The upper voice of bars 1-73 is concerned primarily with Ab and D. D appears prominently in the bar 4 ostinato, in the concluding first phrase of IID at bar 10, and in the first violin of bar 23. These

are shown in half notes on Graph IX. The return of IIA in the first violin at bar 48 initiates a soprano deep background c-5 (Ab-Eb-Bb-F-C-G) beginning with Ab. Eb of the c-5 is also articulated by IIA in bar 49. Bb appears in the first violin bar 52 and also in 53 as the last note of its phrase. F occurs twice in bar 57 supported by the highest dynamic level of the hairpins. C is registrally displaced and occurs twice in bar 61 as the first note of its phrase. G is prominently stated in bar 65 and displaced downwards to its appearance in bar 73.

The unison arrival of the deep background soprano c-5 and the deep background bass c-5 on G in bar 73 is most important because this is the only point in the movement at which deep background soprano and bass cycles converge on a unison and is also the beginning of the development. Chapter XI will show that it is also the point of a special kind of symmetrical modulation.

Development

The soprano of bars 73-152 very clearly articulates a descending interval-5 cycle (G-D-A-E-B-F#-C#-G#). This is accomplished by successive transpositions of a three-note variant of the head of IIH. The last note of this variant (it first appears in bars 74-75 as Ab-Eb-D) always falls on a downbeat and additionally has the longest duration of the three. The descending interval-5 cycle is therefore easy to perceive since unison G at bar 73 is rapidly followed by the first appearance of the variant in the second violin of bars 74-75 which ends on D, the first violin statement in

bars 75-76 which ends on A, the cello statement in the highest voice in bars 76-77 which ends on E, and the first violin statement in bars 83-84 which ends on B. These are followed in first violin bars 85-88 by a new version of the variant which ends on F# in double-stopped octaves. C# of the cycle is reached in bar 112. The filling in between F# of bars 86-88 and this C# by various interval-1, -2, and -3 collections and cycles is shown on Graph IX. C# is prominent due to its extremely high register, its downbeat placement, its subsequent reiteration through four lower octaves, its longer duration, and its accented ff dynamic. Ab, the final note of the background c-5, begins the recapitulation at bar 152 as the first note of IIA. It is foreshadowed in bars 117-119 where, in the top-voice-viola, the last three notes (G#-F#-E) of IIF are transferred down through three octaves. G# begins each of these phrases. The transfer of G# downwards through three octaves relates it to C# of c-5 which undergoes a similar transfer downwards through four octaves in bars 112-115.

Graph VIII shows how the bass of the development continues the background c-5 of the exposition. The c+5 of the exposition is also continued and along with other interval cycles and collections, intersperced and embedded in background c-5.

Recapitulation

The soprano of the recapitulation parallels that of the exposition in that both primarily articulate one pitch, D. The soprano of the development has been shown to be quite different

since it cycles through many pitches by way of c-5. Graph VIII of the background shows how the prominent C and C# of bars 155-168 almost chromatically lead to D of bars 170-172. In bars 218-231 D emphatically expressed by it transfer both upwards and downwards through five different octaves.

Bass C# is a constant presence throughout the recapitulation. It is the final note of the background c+5 (C-F-Bb-Eb-A-C#-F#-B-E-A-D-G-C-F-Bb-Eb-Ab-**Db/C#**) which began in bar 28 of the exposition and arrived at Db in bar 150 of the development. This Db, now called C#, is transferred upwards through seven octaves in bars 154-166. In these bars it crosses C which is transferred downwards. In bars 165-166 all four instruments play C#. In bars 165-170 C# regains its original low register in the cello. This low C# is a continual presence throughout the recapitulation returning in bar 206 as the final pitch of a local c-1, in bar 218 with an fff accented dynamic against the first violins highest D, and in bars 227-233 against the return of I1A.

A second c+5 (F#-B-E-A-D-G-C-F-Bb-Eb) beginning with F# in bar 141 is shown embedded in the bass in Graph VIII. This cycle culminates in the Eb at bar 222, which is transferred upwards through three octaves, and crosses D, which is transferred downwards. This Eb-D crossing echos the C#-C crosing of bars 155-160. Both bass notes, C# and Eb, which are elaborately transferred upwards, are chromatic neighbor tones to D, which is articulated in the soprano throughout the recapitulation.

In the recapitulation the background bass c-5 articulates the segment F-C-G-D in the following ways. F of bars 154 is prominent

through being the highest pitch of the local c-5 segment A-D-G-C-F, by the cello's subsequent huge leap down from it, and by its loud dynamic level. As previously mentioned C is elaborately crossed with C# in bars 155-160. G is found in conjunction with C# of the background c+5 in bars 176-180, 218-219, and 227-233. Additionally it occurs locally with C# in bars 171-172 and 191-192 in double-stops. D, the penultimate note of the cello, is registrally displaced in bar 233.

Background Levels

Graph VII of the deep background shows basic details of the movement. D and Ab are shown with half notes, B and F with quarters, and the interval-5 cycles are beamed as eighth notes. The soprano of the exposition and recapitulation, the outer sections of the movement, consists almost exclusively of D and Ab. There is some use of B and F in the recapitulation. In contrast the soprano of the development consists of an interval-5 cycle that cycles through all twelve tones moving from Ab of the fundamental interval-3 cycle at bar 48 back to the same Ab at bar 152.

The bass of the movement, while emphasizing the fundamental c3, is built of two interval-5 cycles of opposite direction. C-5, beginning and concluding with D of the fundamental interval-3 cycle, moves through all twelve tones twice. C+5, beginning on C in bar 28 and ending on Db/C# at bar 151, moves through the cycle of twelve tones one-and-a-half times. Thus, between top and bottom lines there are three background interval-5 cycles which each cycle

through all twelve tones a different number of times. These numbers of complete interval-5 revolutions are incremental (1, 1 and 1/2, 2) as one moves from the soprano to the bass.

Graph VII further shows how Berg highlights the fundamental interval-3 cycle (D-F-Ab-B) in the upper bass c+5 of the exposition and development. In bar 32 F is displaced downwards one octave. Ab in bar 39 is also registrally displaced in terms of the previous three notes of the cycle. B in bar 46 is emphasized by its being the final note of the cycle in the exposition. This B is reiterated in bar 109 as a member of both c-5 and c+5. At bar 112 F is also displaced downwards two octaves. Octave displacement is also used in the bass c-5 to emphasize notes of the fundamental interval-3 cycle. D is displaced downwards in bar 92, B is displaced downwards in bar 109 and in bar 152 F is displaced upwards by two octaves. Ab in bar 25 is shown in Graph VII as a half note because it coincides with G# of the soprano.

Chapter X

HARMONY

The domain of harmony in Opus 3 presents the greatest difficulty Themes, part writing, and formal structure have all been shown to be composed with interval cycles. While interval cycles are certainly a component of harmony in Opus 3 they do not offer a systematic means for understanding chord structure and progression. Berg's compositional concept in both movements is primarily contrapuntal.

The harmonic worlds of the two movements are very different. This is due to a large extent to the difference in their fundamental interval cycles. The pitches of the fundamental interval-4 cycle (G-B-Eb) all belong to the same whole-tone collection. The pitches of the fundamental interval-3 cycle (D-F-Ab-B) do not. While certain harmonic progressions in the second movement can be understood symmetrically, this is not true of any progression in the first movement. First movement harmony is more homogeneous than that of the second movement and will be discussed in relation to two predominant chord types. The use of a particular three-chord progression will also be discussed and the cyclic content of the final chord will be analyzed. Finally an effort will be made to trace the convergence of linear cycles with chords found at important formal points in the movement.

The discussion of the second movement harmony is less comprehensive since it is more problematical. The harmony of the final bar will be shown to be the result of special part writing criteria. Additionally Berg's play with D minor in the concluding bars will be discussed. Symmetrical aspects of second movement harmony will be explored in the following chapter.

First Movement

The predominant sonorities of the first movement are the whole-tone chord and the whole-tone chord plus one pitch from the other whole-tone collection.[1] The whole-tone chord is relatable to

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[1] Samson (Music and Tradition, 163) presents a harmonic reduction of the coda of the first movement of opus 3, bars 153-87, in which he demonstrates the predominant use of what he calls a 7/3 sonority in the three lower parts. This sonority (for example Bb-Ab-D) consists of three members of the same whole-tone collection. What Samson does not say is that the four-voice result is that you either have a four-note whole-tone chord or a chord composed of three members of one whole-tone collection and a single member of the other.

Archibald (Harmony in the Early Works of Alban Berg, 41-46) identifies five general chord types which are important in Opus 3. These are: 1. tertial harmonies (fourth chords by spelling rather than by perfect interval, F-B-E, F#-B-E, and F-Bb-E are all chords of this type); 2. a chord which contains a perfect fifth and a major third (F-A-E); 3. any whole-tone chord; 4. a chord which contains a major and a minor third (F-Ab-C); 5. the diminished triad (D-F-Ab). He also on page 46 speaks of the "dominance of whole-tone music" in the quartet. While I generally agree with Archibald's descriptions of what goes on harmonically in Opus 3, I find his five chord types problematical as designations since some, the diminished triad for example, are very specific and others, tertial harmonies for example, are not. I find it more useful to distinguish between

the fundamental interval-4 cycle (G-B-Eb) whose members all belong to the same whole-tone collection. The whole-tone-plus-one chord is directly relatable to the head motif of I1A, and to both I2B and I2D (see example 4), which all express the same complex linearly. Perle points to Schoenberg's Opus 11/I as the earliest work to use a whole-tone-plus-one collection and demonstrates the subsequent importance of both whole-tone and whole-tone-plus-one collections in Wozzeck and Lulu.[2]

The predominance of these two chord types can be seen in example 16, which is a harmonic reduction of the exposition. In this example whole notes are used to notate both whole-tone chords (marked WT) and whole-tone-plus-one chords (marked *). Half notes are used to notate equal interval chords. There are significant difficulties in making a harmonic reduction due to the highly contrapuntal nature of many passages and the rhythmic complexity. These together often make it very difficult to ascertain which pitches belong to important vertical sonorities and which are just passing or neighbor tones. Example 16 is a reduction both in the normal sense of eliminating unimportant tones and chords but also in the sense that certain highly contrapuntal bars simply are not there because their complexity does not allow a clear interpretation.

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chords composed of equal intervals (vertical statements of interval cycles), whole-tone chords, and whole-tone chords which contain one foreign note.

[2] Perle, The Operas of Alban Berg I/Wozzeck, 155-159.; Perle, The Operas of Alban Berg II/Lulu, 161-164.

Equal interval chords are employed on occasion and these relate directly to the extensive use of linear cycles. The first chord of example 16 is an interval-3 simultaneity, bar 4 contains an interval-3 simultaneity and an interval-5 simultaneity, and in bar 5 the first whole-tone chord, which is also an interval-4 chord, appears. The progression of equal interval chords is introductory since it leads, through the intersection of the whole-tone chord type with the interval-4 simultanieity, to the clear priority of whole-tone chords, with and without the extra pitch, after bar 5. Equal interval chords are also found towards the end of the development in the three lower instruments in bars 98-100. Here the same order of equal interval chords (Int. 3, Int. 5, Int. 4) that is found in the opening eight bars (see example 16) is used to harmonize three successive transpositions of the tail of I2A (see example 17).

Harmonic progression in the first movement is produced by resolving the non-whole-tone member of a whole-tone-plus-one chord to a tone a half-step down. The result being that all chord tones then belong to the same whole-tone collection. Jarman writes, "The resolution of the dissonance implied by the structure of a chord may be used as a means of obtaining a point of momentary relaxation."[3] Two instances of this kind of progression can be seen in example 16 bars 9-10, where the cello A moves to Ab, and in bar 58, where the viola E moves to Eb.

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[3] Jarman, The Music of Alban Berg, 17. His entire chapter, "Pitch Organization in the Early and 'Free' Atonal Works," (15-79) is relevant.

A particular chord progression, first found in bars 10-11, is used in association with the top voice of I1C. Eighth note groups are used in example 16 to show this progression that contains in its purest form three three-note sonorities whose top voice is a transposition of I1C (E-F-Ab) and whose bottom voice is a transposition of I1B (B-Bb-A). The whole-tone sonority and the whole-tone-plus-one sonority do not figure in the progression. In bars 14-27 imitations of the progression are used with inverted forms of I1C replacing its prime form in the top voice. These imitations contain four voices and in example 16 are reduced from a highly complicated contrapuntal context. In bars 28-31 seven different transpositions of the initial three-note-chord progression are used. There is no apparent pattern to these transpositions. In bars 52-53 of the second-theme-group two rapid variant imitations of the progession occur. Since bars 52-53 are part of a second-theme area and the progression is associated with the first-theme-group these imitations are of little formal importance. The continual use of the transpositions of this three-chord progression combined with whole-tone chords and whole-tone-plus-one-extra-note chords serves to provide a sense of harmonic continuity in the first movement. However, these harmonic devices are not equivelent in musical sophistication to those of the linear domain.

The final chord of the movement, G-C#-F#-B, contains both a three-note segment of a c5 (C#-F#-B) and three notes of the G whole-tone collection (G-C#-B). This double content of the sonority is conceptually related to the linear use of common tones to move from one cycle to another. (This linear technique was first

demonstated in Chapter II in discussion of examples 3c and 3d.) Realizing this double content led to an investigation of both all four-note chords that contain two three-note segments of two different cycles, and all four-note chords that contain a three-note segment of one odd number interval cycle and a three-note whole-tone collection. (If an even number interval cycle is used all four pitches in the chord will belong to the same whole-tone collection.) Example 18 shows all the possible chords generated by these criteria excluding transpositions. All of them are either whole-tone chords or whole-tone-chords-plus-one-note. In the first system of the example the chords in bars 2 and 4 are whole-tone chords. The bar 3 chord has only three different pitches since it doubles G. For these reasons it is only the chords of bars 1 and 5 that are especially interesting compositionally. The chord marked * in bar 1 is a transposition of the final chord of the second movement. The second system shows the four-note chords generated when one of the three-note segments is a whole-tone collection rather than a segment of an interval cycle. The last chord of the example which is marked * is a transposition of the final chord of the first movement. That final chords from both movements are drawn from such a limited collection of special criteria chords suggests that these criteria were important to Berg.

The question of exactly how the linear cycles of the movement converge with chords is an important one. It is particularly relevant to examine the chords that occur at the points of formal division within the movement to see if the verticalities have any formal significance. All of these chords turn out to be of the two types,

whole-tone or whole-tone-plus-one-extra-pitch, that predominate in the movement.

The final chord of the first-theme group of the exposition (E-G#-D-Bb), a whole-tone chord, can be seen in Graph IVA at bar 40. The cello E is the final note of a c-5 (F-C-G-D-A-E) that begins in bar 31. This E moves a half-step down to Eb of fundamental c4 (G-B-Eb) in bar 41. The violin I Bb at bar 41 is the final note of a c+1 (F#-G-G#-A-Bb) that begins in bar 32. As can be seen from Graph III of the middleground, Bb is a most important top line pitch throughout the bridge and second-theme group of the exposition. Just as the cello E at bar 40 is a half-step above Eb of the fundamental c4 (G-B-Eb), so Bb is a half-step below B of the fundamental c4. The two inner voices of the chord are not members of local interval cycles. However, the viola G# is part of the c2 collection (Bb-Ab-Gb-E-D-C) which is in force in bars 32-40. In a similar fashion the violin II D can be understood to refer back to the same c2 collection which predominates in its bars 32-40.

The last chord of the exposition (B-G-E-F), a whole-tone-chord-plus-one type, is on Graph IVA at bar 80. The cello B has been discussed in chapter II (example 3i) as being a simultaneous goal tone for four different interval cycles in addition to belonging to fundamental c4 (G-B-Eb). The violin I F belongs to a c4 collection (F-A-Db) which overlaps both exposition and development. Its most important function here is that it and the preceding Eb both converge on E of bar 81. The viola G, member of the fundamental c4 (G-B-Eb) is the final note of a c+1 (F-F#-G) which begins at bar 76. The violin II E is the final note of a c-2 (Bb-Ab-Gb-E) which begins at

bar 75. E has a special local significance here since it is also the goal in bar 81 of the previously mentioned violin I Eb and F convergence and in addition is the final violin I note (Fb) of I2B in bar 74.

The chord (G-F#-Eb-B), a whole-tone-plus-one type, occurs just before the recapitulation begins and represents the penultimate sonority of the development. The outside notes, G and B, are both members of the fundamental c4 (G-B-Eb) and are maintained into the recapitulation. The violin II D is the final tone of a variant of I2A and the viola F# is the final tone of I1B. Both of these are members of local descending interval-1 cycles.

All pitches of the final chord of the movement (G-Db-F#-B), a whole-tone-plus-one type, are the goals of different cycles. The violin I B and cello G are both members of the fundamental c4 (G-B-Eb). The violin I B is locally also a member of the c2 collection (F-Eb-Db-B-A) of I1A given at bar 184 and also less locally the goal tone of a c-3 (Ab-F-D-B) which begins in bar 173. The cello G is locally the final pitch of a c-5 (F-C-G) which begins in bar 185. The violin II F# is the final pitch of I1B (Ab-G-F#) which begins in bar 185. The viola Db is locally the goal of a c-2 (F-Eb-Db) that also begins in bar 185. In addition the viola Db is the missing tone of the head of I1A in a variant which occurs in the violin I in bar 183.

From these examinations it can be seen that Berg's practice is to usually have the highest and lowest voices of chords in important formal positions belong to the fundamental c4 (G-B-Eb). Often these pitches are also goal tones or members of middleground cycles embedded in the fundamental cycle. Inner voices of chords in

important formal positions can be accounted for in a variety of ways: as goal tones of local cycles, as final tones of themes, as members of a c2 collection, or occasionally as members of the fundamental c4. Thus it can be said that the most prominent voices, soprano and bass, of important harmonies are carefully coordinated with the unfolding of the fundamental cycle.

Second Movement

In discussing second movement harmony let us first turn to the problematical last measure of the work. It will be shown that special considerations generate the part writing that produce the harmony.

The gesture of bar 233 is similar to that of bar 154. In bar 154 the lower three parts are virtually all composed of uninterrupted linear interval cycles. Example 19a accordingly analyzes bar 233 for linear cycles. While most of the notes present in bar 233 can be accounted for in this way, the notes that are not members of cycles make the situation far from clear. The manner in which the cyles are intercalated is not obviously systematic. In comparison, the use of cycles in bar 154 is immediately apparent. Example 19b shows the derivation of the cello part in terms of motives presented previously in the movement. This avenue of understanding is also not very helpful since it does not apply to the other three parts and also does not explain the final cello E. Neither linear cycles or motives fully explain harmonic progression in this bar 233.

In the discussion of first movement harmony I mentioned that the final chord of the second movement (E-F#-G-Ab) contains three-note segments of both a whole-tone (E-F#-Ab) and a semitonal (F#-G-Ab) cycle (In the first system of example 18 bar 1 is a transposition of this chord). The particular three-note segment of the semitonal cycle Berg uses in the final chord consists of the

same pitches as I1B (Ab-G-F#). These are also the pitches that began the movement as part of IIA. Example 19c shows the final chord and its components. These components are empolyed in the part writing of bar 233.

Each instrumental part linearly implies the presence of one or more three-note segments of semitonal cycles. Each of these semitonal cycles naturally contains two notes of a whole-tone cycle. Therefore one additional note is required to produce a three-note segment of that whole-tone cycle. There are two pitch choices, a whole-step above or a whole-step below the semitonal cycle, that produce this result for each three-note segment of a semitonal cycle. Berg always presents one of these choices and often gives both. In example 19d the pitch content of each part is shown with the semitonal cycles beamed as eighth notes. The unstemmed quarter notes on either side of the eighths represent a fourth pitch that Berg combines with the beamed three-note semitonal cycle segment to produce a three-note segment of a whole-tone cycle. The violin I and cello both linearly articulate the pitches of the final chord (E-F#-G-Ab) in this way. Berg always presents the pitches of each semitonal segment in ascending or descending sequence even though they are not consecutively presented. These constructions are shown in example 19e beamed as eighth notes. The use of dashed stems in the violin II part indicates that either one of two pitches can be understood to complete the four-note unit.

There are several pitches in example 19e that do not belong to the four-note units just described. These can be seen to all be members of consecutively presented three-note segments of

interval cycles. Bar 154, the gesture source for 233, uses this kind of direct cyclic segment and in fact uses segments of the same three interval cycles (2, 4, and 5) that generate the violin I D-E-F#, the violin I B-Eb-G, and the viola E-A-D of bar 233. Only the penultimate D of the violin I does not fit either the criterion of membership in a unit of final chord cyclic content or in a consecutive three-note segment of an interval cycle. Since D is the most important note of the fundamental interval-3 cycle (D-F-Ab-B) its presence as the highest pitch of the bar in its penultimate position is not suprising. In summary the harmonies of bar 233 are the result of linear part writing that anticipates the content of two different interval cycle segments in the final chord.

In this context the penultimate chord of the movement (D-F-A-D) is a D minor triad. Berg's penchant for incorporating vestiges of traditional tonality into his compositions is a lifelong habit and has been generally acknowledged. Jarman writes specifically of D minor saying that for Berg it had some special association with his wife, Helene.[4] The String Quartet Opus 3 is dedicated to her.[5]

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[4] Jarman (The Music of Alban Berg, 18, note 1) quotes a letter of July 16, 1909 to his wife in which Berg says of a D minor piano piece he composed for her, "How wrong you were to call this enchanting humour silly nonsense. On the contrary, it's the most superb sense, in which the most glorious D minor chords of your soul sound forth in their full magnificence." (Berg: Letters to his Wife, 62). Jarman also notes the use of D minor in Berg's Opus 2 No. 1 and 3 songs, in the Opus 6 Orchestral Pieces, in Der Wein, and in Wozzeck.

Samson (Music in Transition a study of tonal expansion and atonality 1900-1920, 160) writes, " The virtual obsession of the "Second Viennese School" with D minor (significant in view of the associations of the key in Classical and Romantic literature)

The play with D minor is compositionally possible because of the common membership of D and F in both the D minor triad (D-F-A) and the fundamental interval cycle (D-F-Ab-B). An early hint of D minor exists in the I1C component, Bb-C#-D, of IIA since these notes comprise the last three pitches of a D harmonic minor scale. However, D minor is most strongly implied in the concluding bars of the movement by the constant presence of the c3 collection, C#-E-G-Bb. These notes taken as a chord are the VII_7 of D minor which often has a dominant function in tonal music. While there is a more important symmetrical aspect to the c3, C#-E-G-Bb, which will be discussed in the next chapter, D minor is suggested because this c3 collection, which is predominate in bars 231-233, is followed rapidly by the D minor triad in bar 233. Despite this implication of a D minor cadence in the final bars, D minor has no significant structural meaning in Opus 3/II.[6]

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reached a culminating point in the D minor interlude from Wozzeck, where again the bass V-I progressions" (as in Opus 3) "follow pedal points of C# and Eb."

[5] The quartet was composed during Berg's courtship of Helene and its premiere on April 24, 1911 was closely followed by their wedding on May 3, 1911. (Willi Reich, Alban Berg, 34) After the String Quartet was successfully performed at the Salzburg Festival of the ISCM on August 2, 1923 Berg wrote his wife, "Oh, God-I shall never forgive myself for not having brought you with me. Wouldn't you still like to come even now?... people should see what you look like, you to whom the Quartet belongs, you, who gave it birth." See Letter #337 of August 3, 1923 in Alban Berg Letters to his Wife, 327.

[6] Archibald (Harmony in the Early Works of Alban Berg, 89) writes," The tonality of the second movement of Op. 3 is not so much D minor as it is simply the tonic D, for the harmonic operations of the piece

a minor triad is not especially relevant." Archibald does not however identify the tones of fundamental c3 (D-F-Ab-B) or Ab with D as having priority within the movement.

Jarman (The Music of Alban Berg, 16) writes, "The tonal allusions in Berg's music, at least in the works from the Op. 3 String Quartet until the late twelve-note works, may be said to have an articulative and expressive,. rather than unifying, function."

Chapter XI
SYMMETRY IN OPUS 3

The presence of symmetrical formations in Opus 3, their relevance to the formal structure of the second movement, and their relevance to the relation of both movements will be explored in this chapter. The discussion begins with a brief explanation of sum dyads, cyclic sets, and symmetry--all components of Berg's musical language that find their most sophisticated employment in Lulu[1]--that is followed by local examples of these from both movements. The second movement as a whole is then examined and its background cycles and important sums related. Finally the fundamental interval cycles of both movements are investigated as a complex for their symmetrical and musical implictions in Opus 3.

Preliminaries

In this discussion pitches will sometimes be represented by numbers. The conventional practice of C=0, C#=1, D=2... is followed. These numerical representations of pitch allow for a simple mathematical explanation of symmetry. In the case of dyads, any pair of dyads whose sums are the same are symmetrically related to one another and to a common axis of symmetry. These dyads can be

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[1] See "Cycles and Arrays" and "Conclusions" in Perle, The Operas of Alban Berg II/Lulu, 161-207.

expressed either melodically or harmonically. Example 20a shows an alignment of two semitonal cycles of opposite direction which produces dyads of sum 8, a sum that will be seen to be important in the second movement. For sums of 12 or more it is necessary to subtract 12 since this is really a base 12 system. Any two cycles of same interval and opposite direction can be aligned to produce dyads of a constant sum. If the sum is an even number it follows that the axes of symmetry are two unisons separated by a tritone. In example 20a these are E and Bb/A# which are shown as whole notes. If the alignment is such that it produces dyads of an odd sum then the axes of symmetry are two minor seconds separated by a tritone.

Pitches of two cycles of the same interval but opposite direction can be alternated to produce a cyclic set. A cyclic set expresses two sums in alternation. Example 20b presents a cyclic set which expresses sums 7 and 8. Perle has noted the use of two interval-5 cycles of opposite direction (see example 1b), which represent a partitioned cylic set, in the opening of Berg's Lyric Suite.

In the case of a four-note chord there are three diffferent ways to interpret dyadic sums. That is to say any note may be added to any one of the other three to produce the first of a pair of sums. In order for two four-note chords to be symmetrical they must both share the same pair of sums. Example 20c shows a four-note chord which moves symmetrically to another four-note chord. These

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2 Perle, Serial Composition and Atonality, 63.

chords are symmetrically related because they both contain two dyads of the same sums. In this example these are sums 7 and 8.[3]

Local Symmetical Structures in Opus 3

There are only two instances of symmetrical formations in the first movement and neither of these is rigorous. In the main theme of the quartet, I1A (see example 14a), B functions as the axis of two inversionally related semitonal cycles. These cycles can be only momentarily regarded as a cyclic set since the descending cycle contains only five pitches (Db-C-B-Bb-A), while the ascending cycle contains nine (B-C-C#-D-Eb-E-F-F#-G)(see example 10). The other example, a kind of quasi-cyclic set, can be seen in middleground Graph III in the cello bars 22-41. Here two inversionally related interval-5 cycles diverge from B. This formation, which has been extracted from the foreground, is not a strict cyclic set because its pitches are not strictly ordered alternations of c+5 and c-5.

Sum 8 is particularly important in the second movement. Example 14a illustrates that sum 8 is one of two sums of the cyclic sets that are present in both the tail of IIA and in IIC.[4] Sum 8 is

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[3] For further discussion of the concepts of symmetry in both dyads and progressions, of cyclic set, and of dyadic sums and differences see the first five chapters in Perle, Twelve-Tone Tonality.

[4] Archibald (Harmony in the Early Works of Alban Berg, 62) in "A Tour de Force of Wedges Op. 3 II 1-3" discusses these themes and the many wedges (his term for Perle's 'cyclic set') of this passage. While Archibald does not employ the concept of sum in his dissertation his observations about wedges are most important

also expressed in dyads at the end of IIB. In addition to these instances sum 8 dyads are present in great abundance in dyads of the first thirty-four bars of the second movement. This has been pointed out by Perle[5] and is shown in my example 21.

Another instance of symmetrical formations in this movement has also been pointed out by Perle.[6] This occurs in bars 72-73 where two sum 8 dyads are reinterpreted as two sum 2 dyads. Example 22a shows this reinterpretation. D and F# (2+6=8) and Ab and C (8+0=8) are conceptually reassociated as D and C (2+0=2) and F# and Ab (6+8=2). This is confirmed by the four unison Gs (7+7=2 and 7+7=2) which are symmetrically related to D-C-F#-Ab through the common content of two sum 2 dyads. This example is of great interest because it comes at the formal point between the exposition and development and because it is probably the first historical example of modulation through reinterpetation of sum couples.[7]

The modulation from sum 8 to sum 2 is prepared in a variety of ways. Sum 8 has been well established in the first thirty-four

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since he is the first to describe the musical effects of what is actually the employment of sum 8 and cyclic sets.

[5] Perle, "Berg's Master Array of Interval Cycles," The Musical Quarterly 63/1, 4-10.; Perle, Twelve-Tone Tonality,76-79.

[6] Perle, "Berg's Master Array of Interval Cycles," The Musical Quarterly 63/1, 8.; Perle, Twelve-Tone Tonality, 13.

[7] See my footnote 9 of Chapter I. For additional discussion of this kind of modulation see Perle, Twelve-Tone Tonality. Chapter 24. "Composing with Sum Tetrachords" is particularly relevant.

bars of the movement (see example 21). The final exposition statement of IIA in bar 61 finds sum 8 again expressed between the cello Ab (8) and the first violin C (0). In bars 64-65 Ab-G in the first violin and C-C# in the cello again produce sum 8 (8+0=8 and 7+1=8). In bars 67-73 the first violin and cello parts combine to produce dyads of sum 2 on each downbeat (bar 67: E-Bb [4+10=2]; bars 68-69: F-A [5+9=2]; bar 70:G-G [7+7=2]; bars 71-72: F#-G# [6+8=2]; bar 73: G-G [7+7=2]). Thus, the modulation from sum 8 to sum two in bar 73 is foreshadowed by the expression of these sums in the outside voices of the preceding bars. The arrival of the unison G in bar 73 is further strengthened by its corresponding to the unison convergence of the soprano and bass background interval-5 cycles as shown in Graph VIII. Graph X shows that the second violin G of bar 73 is also the goal tone of a local c+5 (E-A-D-G) which originates in bar 61.

Another example of a passage where the chord progression is based on symmetrical motion is found in bars 95-96 of the second movement. Here the four pitches of the first chord can be understood to be two dyads which are both of sum 11, or two dyads of sums 7 and 3. I have chosen to show these bars in the sum 7 and 3 form in example 22b. The symmetrical chords are notated in example 22b as whole notes while the intervening sonorities, which preserve only one of the sums (either 11 or 7 depending on interpretation), are notated as unstemmed quarters.

In addition to the above examples there are also many progressions within the second movement that are almost symmetrical. Within a context of three-voice chords it is not

uncommon to find movement by equal interval with two of the voices moving in the opposite direction from the third voice. This kind of motion can be seen in bar 93. The tremolo chords first heard in bar 35 consist of four voices which move by equal interval. In these chords three voices move in contrary motion to the fourth by the same interval.

Sums in the Background Cycles of the Second Movement

Sum 8 is the most important sum in the second movment. Its use on the musical surface has been demonstrated. There are also significant sum 8 alignments in the arrangement of background cycles. Graph VIII of the background should be refered to for the following discussion. In the exposition at bar 28 C, the first pitch of the bass c+5, occurs against a top line Ab to produce sum 8 (0+8=8). At bar 61 these two pitches are again aligned by the soprano C and bass Ab. At bar 152, the beginning of the recapitulation, again a soprano Ab is aligned with a bass C.

Further sum 8 alignments can be seen on Graph VII of the deep background. The soprano F# of bar 86 and the bass D of bar 96 overlap to produce sum 8 (6+2=8). This is significant because bass D represents a return to the first pitch of its c-5 and D is also the primary pitch of the movement. There is also an instance of the same pitches, Bass F# and soprano D, being aligned in the exposition at bar 22. In Graph VII the soprano Ab of bar 152 can be understood to align with the bass C of c-5 in bar 160. Thus, the bass C discussed in the previous paragraph, which directly aligns with the

soprano Ab in bar 152, is also represented in a deeper cycle. The last note, C#, of the bass c+5 is present through most of the recapitulation. This is also true of G of c-5 which begins at bar 180. C# and G are also a sum 8 dyad (1+7=8). In summary the first and last notes of both the soprano c-5 and the bass c+5 are aligned either with each other or the bass c-5 to produce sum 8 dyads at important formal points in the movement.

In view of the fact the first and last notes of these background cycles are important in relation to sum 8, I wondered if they also might relate to the structure of the final chord (see example 19 and discussion in previous chapter). Since the background bass cycles cover the entire length of the movement they are the subject of this analysis. Graph VII of the deep background of the second movement shows the two bass interval-5 cycles of opposite direction. The c-5 begins and ends with D and the c+5 begins with C and ends with C#. These three pitches, C-C#-D, constitute a three-note segment of a semitonal cycle. In order to produce a three-note segment of a whole-tone cycle by the addition of one pitch--duplicate the cyclic content of the final chord--either Bb or E is required. E, of course, is the final bass note for the movement. If this unit, C-C#-D-E, is combined with the pitches of the final chord, E-F#-G-Ab, the result is the aggregate C-C#-D-E-F#-G-Ab. This is a symmetrical construction around the note E. C and Ab (0 + 8) are a dyad of sum 8 as are C# and G (1 + 7), D and F# (2 + 6), and E and E (4 + 4).

If these two units, C-C#-D-E and E-F#-G-Ab, are taken separately, and the other possible note that produces a different

three-note segment of a whole-tone cycle is added (as Berg does repeatedly in bar 233) the result is Bb-C-C#-D-E and E-F#-G-Ab-Bb. Both these structures are symmetrical: the first around C# the second around and G. If the sums are calculated as before Bb and E (10 + 4), C and D (0 + 2), and C# and C# (1 + 1) are all dyads of sum 2 as are the dyads of the second structure. It has been shown (example 22) that in bars 72-73, which end of the exposition and begin the development, Berg reinterprets dyads of sum 8 as sum 2 by reassociation. Graph VIII shows that sum 2 is represented in bar 73 in the convergence on G by both the soprano c-5 and the bass c-5 (7+7=2). Sum 2 is therefore the other important sum of the movement and, as does sum 8, relates to the beginning and concluding notes of the bass background cyles and to the final chord.

Graph VII reveals that the two interval-5 cycles of the deep background bass converge on unisons three times: on C in bar 28, on B in bar 109, and on Bb in bar 137. It is interesting to note that C-B-Bb is a transposition of I1B (Ab-G-F#) which was shown in Graph II to be important in the background structure of the first movement. The two pitches which could be added to C-B-Bb to produce a three-note segment of a whole-tone cycle--duplicate the cyclic content of the final chord--are D and Ab, the priority pitches of the movement. The aggregate of Ab-Bb-B-C-D is symmetrical around B at sum 10 (Ab-D: [2+8=10]; Bb-C: [10+0=10]; B-B: [11+11=10]). Sum 10 appears at the conclusion of the movement as part of the final transposition of IIA (see example 23a). The special aspects of this transposition and sum 10 will be discussed in the last section of this chapter.

Background Symmetrical Progression in the Second Movement

It has been shown that sum 8 is repeatedly expressed in the exposition, that three second movement themes, IIA, IIB, and IIC, contain dyads of sum 8, and that there is a connection between sum 8 and the deep background. Let us discuss the deeper significance of sum 8 dyads.

There are two elements of the second movement that are immediately prominent. The first of these is the importance of Ab and D as members of the fundamental interval-3 cycle, D-F-Ab-B. The second is the use of sum 8. That these two elements are related is not so readily apparent. In IIA of bars 1-4 the c3 collection A-C-Eb-F# are very prominent. How this occurs was discussed in Chapter II and illustrated in example 3a. Example 13b shows both this c3 collection and the notes of the fundamental cycle (D-F-Ab-B) that are present in IIA. These two interval-3 collections comprise the most important feature of IIA through their placement at beginnings and endings of slurred segments, their registral prominence, and their placement in rhythmically strong positions. These two interval-3 collections can be aligned to produce dyads of sum 8.

6(F#)	3(Eb)	0(C)	9(A)
2(D)	5(F)	8(Ab)	11(B)
8	8	8	8

There is compositional support for these alignments. In IIA the first linear dyad of sum 8 consists of the A-B, the second of Ab-C, the third of F#-D, and the last of F-Eb. All four sum 8 dyads in the above alignment of the two c3 collections are present in IIA and all other possible sum 8 dyads--Bb-Bb, C#-G, and E-E--are absent. The E's in bar 3 are never really established as clearly representing a sum 8 dyad. Example 21 illustrates that two of the above alignments, dyads Ab-C and D-F#, are particularly emphasized in the first thirty-four bars of the movement. Both of these dyads are articulated by the beginning of IIC in bars 5 and 23. F#-D is articulated by the first three notes of IID in bars 9-10. In bars 29-34 both dyads are continually present to the exclusion of almost anything else. The prevalance of sum 8 and the linear embedding of the c3 collections C-Eb-F#-A and D-F-Ab-B are then part of the one complex.

IIA reappears in the cello in a quasi-transposition at the conclusion of the movement in bars 223-227. The nature of the quasi-transposition will be discussed shortly but let us now focus on its result. This quasi-transposition results in the interval-3 collection C#-E-G-Bb replacing the interval-3 collection of A-C-Eb-F# in the first four slurred segments of IIA and the interval-3 collection D-F-Ab-B in the remaining ones. The lower staff of

example 23 demonstrates how the new version of IIA emphasizes C#-Bb-E-G by their being the last notes of the first four slurred segments. Bb is reiterated in bar 226 four times finally leading to the accented C#-G of 227. Additionally this collection is stated vertically by the lower three instruments in bars 231-233. This collection can also be aligned with itself to produce dyads of sum 8.

1(C#)	4(E)	7(G)	10(Bb)
7(G)	4(E)	1(C#)	10(Bb)
8	8	8	8

The implication is that symmetrical movement has taken place on a large scale. The conflicting interval-3 collections of the opening of the movement aligned at sum 8 have moved to a unison interval-3 collection aligned at sum 8 through symmetrical motion of a half-step. This is shown in example 23b where the interval-3 collections are given as four-note chords. Details that support the above sum 8 alignment shown in example 23d include the cello C#-G of bars 227-233, which comprise a sum 8 dyad, and the final cello E, which can be understood to be the symmetrical convergence of the C# and G on a unison double E of dyadic sum 8. In the opening two bars of the movement E is explicitly presented in this way in the convergence of violin II and cello semitonal cycles that produce sum 8 dyads. This cello E, which actually represents two unison E's, can be seen in bar 2 of example 21. The progression shown in 23b is never literally stated in the music but rather implied by the quasi-

transposition of IIA and the treatment of the c3 collections in the opening and closing bars of the movement.

D and Ab of the fundamental cycle, which have been understood throughout the movement to have a central priority, are retained at the end of the movement. Example 23c shows how the chord of C#-E-G-Bb-D in bars 231 and 232 consists of the interval-3 collection C#-E-G-Bb and D of the fundamental c3 (D-F-Ab-B). The final chord (E-F#-G-Ab) contains E and G of the interval-3 cycle of C#-E-G-Bb and Ab of the fundamental c3. F#, shown as an unstemmed quarter in the example, has already been shown in example 19c to be a member of both the three-note segment of the semitonal cycle that corresponds to I1B (Ab-G-F#), which is stated as a simultaneity in the final chord, and additionally to belong to the three-note segment of the whole-tone cycle (E-F#-Ab). The priority of D and Ab of the fundamental cycle is shown by presenting them in the highest register of example 23c.

In example 13 IIE was shown to be the only theme in either movement to be exclusively built around an interval-3 cycle. This theme is almost always in the development. It occurs several times in bars 120-136--in prime and retrograde inversion--in various transpositions that cover each of the three c3 collections. However, the c3 collection of A-C-Eb-F# has priority with this theme since it it used in the first statement of IIE in the viola at bar 120 and in the only statement of the inversion in the viola of bar 134. This inversion is also the last statement of IIE in the movement. That the interval-3 collection C#-E-G-Bb is the least important of the three c3 collections used with IIE supports the idea that interval-3

collections of D-F-Ab-B and C-Eb-F#-A are in conflict and are only symmetrically resolved to the interval-3 cycle of C#-E-G-Bb at the conclusion of the movement. It would be anticlimatic for the interval-3 collection C#-E-G-Bb to be emphasized before the final bars.

Let us return to the nature of the quasi-transposition of IIA in bars 223-227. Since this is the only tranposed version of IIA and also the last occurrence of IIA in the movement it is of special interest. The first fifteen tones of IIA are transposed down a perfect fourth. With the exception of two pitches the remaining tones are transposed up a perfect fourth. Essentially Berg has split the theme and then transposed its two parts by the same interval but in opposite directions. This is a very particular kind of transposition that hints Berg was thinking along symmetrical lines.

There are compositional reasons that explain the two pitches that do not fit into the transposition scheme just described. These pitches, G# and A, are shown in parenthesis in example 23a and are from the upper register of the cello's polyphonic melody. If Berg exactly followed the transposition scheme these notes would become G and Ab and a repeated G would result in the upper voice of the polyphonic melody. G, the last pitch of the transposition down a perfect fourth, would be repeated in the second pitch of the following music. This is melodically undesirable. It might be wondered why Berg didn't transpose all of IIA down a perfect fourth. if this is done the tritone G-C# results between the last note of the first part and the first note of the last part. Berg wished to save

these pitches for the end of this theme since they play such an important role in the final bars of the movement.

The choice of G# and A to replace G and Ab in the transposition scheme of IIA makes sense in terms of sum dyads. If a literal transposition up a perfect fourth is performed on the first four pitches of the first section of IIA the result is B-G-Bb-Ab. These pitches form dyads of sum 6 (B-G [11+7=6] and Bb-Ab [10+8=6]). When Berg chose G# and A to replace G and Ab he actually preserves sum 6 although it is expressed by different pairings. If one begins with the last note of the first section of IIA in example 23a the notes are G-B-G#-Bb-A-A. These also express sum 6 (G-B [7+11=6], G#-Bb [8+10=6], and A-A [9+9=6]).

Symmetry in the Aggregate of the Fundamental Cycles

The combined notes of the fundamental cyclic partitions of both movements taken as a complex, F-G-Ab-B-D-Eb, are symmetrical around B-B and F-F. B and F are delineated by the head motif of I1A, the main theme of the quartet. B has just been shown in the previous chapter to be the only common tone between the two fundamental cycles. Its importance within Opus 3 is further enhanced by its being an axis symmetry for the aggregate of both fundamental cycles. The constant sum generated by the symmetrical arrangement of the two fundamental cycles is 10.

5 (F)	7 (G)	8 (Ab)	11 (B)
5 (F)	3 (Eb)	2 (D)	11 (B)
10	10	10	10

Sum 10 does not play a great role in either movement of the quartet but it is prominently expressed at the conclusion of the work. It is found in the G-Eb and A-C# dyads of the first violin in bars 215-220 as well as in the first violin's D-Bb of 221-222. It is also the sum generated in the quasi-transposition of IIA of bars 223-227 that replaces sum 8 in original transposition of IIA. This is shown in example 23a. Additionally it should be remembered that D (2) and Ab (8), the two priority pitches of the second movement, constitute a sum 10 dyad and are symmetrical around the C-B-Bb discussed in the final paragraph of this chapter's Sums in the Background Cycles of the Second Movement.

Chapter Summary

Sum 8 is a primary feature of the second movement. It is present in local dyads and is articulated at important formal points by the coordination of the background soprano and bass interval-5 cycles. It furthermore is a component of the implied symmetrical progression from the two different c3 collections in IIA to the third collection articulated by the quasi-transposition of IIA at the end of the movement.

The first movement contains very little material of a symmetrical nature. However, the aggregate of the fundamental cyles of both movements is symmetrical around the unision axis B,

which is also the only pitch that the two fundamental cycles have in common. B is additionally the most important pitch in the head of I1A and it is this theme that returns at the end of the second movement. The aggregate of the two fundamental cycles generates dyads of sum 10 and this sum is expressed in the bars which precede the return of I1A in the final bars of the second movement. The appearance of I1A and dyads of sum 10 in these final bars can be understood to represent a summation of the intersection of both movements.

The instances of overt symmetrical progression by sum tetrachords are few. The most important of these, the modulation from sum 8 to sum 2 in bars 72-73, is carefully prepared in the linear part writing. However, the conclusion must be drawn that symmetrical harmonic progression, while suggested in many details, is secondary to the linear cyclic unfoldings.

Chapter XII
CONCLUSIONS

1. Opus 3 is a structurally unified work. This is achieved by the derivation of themes through a complex of different relations centered on I1A and IIA and a common pitch connection, B, between the different fundamental interval cycles (c4: G-B-Eb; c3: D-F-Ab-B) of the two movements. Additionally this B represents the dual axis of symmetry (B-B and F-F) which exists in the aggregate formation of both fundamental cycles.

2. Berg's use of interval cycles in the linear dimension of Opus 3 is pervasive, elaborate, skillful, and sophisticated. It demonstrates at the very least an intuitive grasp of the importance of interval cycles to the development of a new musical language as directors of motion to or from a particular pitch. The use of interval cycles on the largest scale to generate formal divison is an important kind of solution to the problem of large-scale form in an atonal idiom. It also indicates careful precompositional planning by Berg. Precompositional planning is also indicated by the equal number of bars allotted to first-theme group and second-theme group material in the first movement. The use of two inversionally related cycles which diverge from a unison axis--cyclic sets--in the tail of I1A, in IIB, and in IIC, as well as on deeper structural levels of the two movements is an important and special compositional development.

3. Symmetrical structures and progressions in the second movement as well as the employment of cyclic sets suggest Berg understoed symmetry on some level. Whether or not Berg was really consciously aware of the harmonic implications of symmetry, Opus 3 is the earliest known example of a work which has within it an intelligent use of symmetry to articulate large-scale form and progression. Opus 3 contains symmetrical progressions and structures which are forerunners of procedures found in later works by Berg and Bartok. George Perle has developed these elements in Twelve-Tone Tonality and in his own compositions. It is curious that symmetry plays no important large-scale role within the first movement since symmetrical formations are found in the second movement and symmetry can also serve as a partial explanation of the relationship between the two movements.

4. While the horizontal aspect of the composition shows great skill the harmonic arena is problematic. Berg has managed a kind of integration of these two dimensions through the pervasive use in the first movement of whole-tone based sonorities and the transposed repetition of a three-chord progression. The second movement is more sophisticated harmonically since it relies on symmetrical relations in a number of important instances to generate both melody and harmony. Despite this there is still not a clear harmonic basis for understanding the linear events of Opus 3.

5. Many of the methods of generating foreground details in Opus 3 are idiosyncratic and bear no clear and important relation to form, intervalic structure, or symmetry. These include the derivation of themes from one another (example 14), the dissolution

of I2E (example 9), the play with D minor (Chapter X), and certain voice-leading details (example 8). Part of the fascination and richness of Berg's compositions is his reliance on many different compositional techniques. However, often these do not have implications beyond their local use.

6. The richness of thematic invention and the overall skill demonstrated in the careful composing out of Opus 3 on every level from deep background to foreground mark it as belonging in the first rank of compositions.

The Score

Berg, Alban. Streichquartett op. 3, philharmonia No. 309, Philharmonia partituren in der Universal Edition, Wien-London, 1925. Renewed Copyright 1953 by Helene Berg.

Selected Annotated Bibliography of Analytical Writings on Berg's Opus 3 and other important sources

Adorno, Theodore W. *Alban Berg.* Elisabeth Lafite, Vienna, 1968.

Outlines the sonata-form on the first movement and the rondo form of the second movement giving bar numbers for important themes and events. Nine musical examples and six pages of relevant text, pp. 63-71. Written in German.

Archibald, Bruce. *Harmony in the Early Works of Alban Berg.* PhD diss, Harvard University, 1965.

This and the Schweizer listing are the most comprehensive analyses of Opus 3. Archibald's dissertation is a particularly valuable contribution since in addition to being the earliest comprehensive treatment of Opus 3 it centers on harmonic details and relates them to other early compositions of Berg. It is the best Opus 3 source in English. Archibald discusses whole-tone harmony in Opus 3 (pp. 31-32 ; ex. 22, p. 9 of examples vol.), designates and discusses five chord types (pp. 13-17; ex. 33-40, pp. 13-17 of examples vol.), points out and discusses the use of wedges in the second movement bars 1-3 (pp. 62-63; ex. 49-50, p. 21 examples vol.), gives detailed

attention to the arpeggio of II bars 53-54 violin I (pp. 68-69; ex. 54, p. 23 examples vol.), and discusses the sonata-allegro form of both movements (pp. 87-97). This last discussion includes a complete roster of themes from both movements and a detailed diagram of the internal divisions of each movement (ex. 64-65, pp. 28-31 examples vol.). While I disagree with Archibald on certain minor details I find him generally to be accurate, penetrating, and musical.

Berg, Alban. "What is Atonality?." *Music Since 1900*, by Nicolas Slonimsky, W.W. Norton & Company Inc., New York, 1928, pp. 565-71.

Translation from German of a transcript of a radio show Berg appeared on in 1930. Originally printed as "Was ist Atonal?" in *23*, the music magazine edited by Willi Reich, No 26/27, Vienna, June 8, 1936. Contains important general observations by Berg on the relationship between traditional tonality and the atonal style of the Second Vienna School.

Blankenship, Shirley Meyer. "Berg. Lines: Opus 3: *Lyrische Suite*." D.M.A. diss., University of Illinois at Urbana-Champaign, 1977, 173 p.

The flaw in this source is that no attempt is made to consider the lines of the two Berg quartets in relation to either form or harmony. Form and harmony are never discussed at all. Instead the lines are treated as if they exist without reference to either of these aspects. The treatment of the lines is a rather mechanical presentation in which eleven linear characteristics are found in various examples. There are many examples that are problematical for me. One of these is on pages 89-90 where Blankenship presents what she says are the seven melodic ideas which Berg systematically employs in Opus 3. Some of these happen to be themes (her motives 1, 2, 4, 5,

and 7 correspond respectively to my I1A head, I1B, I1A tail, I1C, and I2B) while others seem arbitrary choices (her motive 3 is a segment of c-5 (F-C-G) and her motive 6 (C-Db-Eb) is the middle voice of the chord progression of bars 10-11 of the first movement). Her motive 6 is of no real significance and additionally she ignores other important themes of the movement. Despite my overall negative evaluation of this source it must be said in fairness that Blankenship occassionally does hit on important examples of Berg's thematic practices.

Carner, Mosco. *Alban Berg.* Duckworth, London, 1975.

Contains brief discussion of principal themes of both movements and their relationships to one another. Also outlines large sonata- form divisions (exposition, development, recapitulation, coda) of first movement and rondo form divisions of second movement with bar numbers. Offers an interpretation as to compositional relationships between the two movements. Four pages of text and two-plus pages of musical examples, pp.102-108.

DeVoto, Mark. *Alban Berg's Picture-Postcard Songs.* PhD diss, Princeton University, 1967.

In Chapter 9 (pp. 101-115), "Style and Method: Opus 3, Opus 5, and Some other Works," there is a paragraph of discussion of Opus 3. Eighteen brief musical examples from Opus 3 are given to demonstrate characteristic Bergian techniques including written out accelerandi, chromatic lines in contrary motion, the motivic principle of association of chords, the device of dividing a melody into two chromatic lines in contrary motion, transformations of a motive, parallel motion of chords, whole-tone harmony, and new types of chords.

Hilmar, Rosemary. *Katalog der Musikhandschriften, Schriften und Studien Alban Bergs im Fond Alban Berg und der Weiteren Handschriftlichen Quellen im Besitz der Osterreichischen National bibliothek.* Universal Edition, Vienna, 1980.

Holland, Dietmar. "Dialektik der musikalischen Freiheit: Alban Bergs freie "Atonalitat in seinem Streichquartett op. 3." In Metzger and Riehn, *Alban Berg Kammermusik II,* pp. 29-37.

A general essay on the early years of the atonal style of composition is followed by a discussion of Opus 3/I. This discussion traces some basic events and divisions in the movement. Contains no musical examples and is written in German.

Jarman, Douglas. *The Music of Alban Berg.* University of California Press, Berkeley and Los Angeles,1979.

Identification of five motivic cells contained in the opening bars of Opus 3 and illustration of how they are constantly transformed and integrated to form the thematic material of both movements. Two sets of musical examples and four paragraphs of relevant text, pp. 32-4; Also discussion of formal structure of entire quartet, pp.177-78.

Murray, Robert P. *The String Quartets of Alban Berg.* PhD Diss., Music literature and performance--violin: Indiana University, 1975, 98 p. (type-script).

I have not been able to obtain a copy of this dissertation. The following abstract by Murray from RILM 75/1561 suggests that the thrust of the paper is not directed toward pitch analysis.

A comparison of the emotional content and the

compositional technique of Berg's two string quartets. Separated by 16 years, they demonstrate a change from the late Romantic to the dodecaphonic style. The adaptation of the Classical form and the use of numerology are discussed. This study and RILM 75/2573 ("Evolution of Interpretation as reflected in successive editions of J.S. Bach's *Chaconne* ") comprise the dissertation.

Perle, George. "Berg's Master Array of the Interval Cycles." *The Musical Quarterly*, Vol. LXIII, No. 1, (January 1977), pp. 1-30.

Detailed analysis of bars 1-10, pp. 4 and 6, of the first movement of Opus 3 which identifies interval cycles used in a variety of compositional ways. This analysis, in its approach and attitude, offers a valuable beginning towards an analysis of the complete work. The entire article is of the greatest importance in understanding Berg's compositional procedures. Two paragraphs of text concerning Opus 3 and two musical examples.

_____. *Twelve-Tone Tonality.* University of California Press, Berkeley-Los Angeles-London, 1977.

Chapter 20 (pp. 76-79), "Alban Berg's Master Array of the Interval Cycles," includes part of Perle's analysis of Opus 3 originally found in "Berg's Master Array of the Interval Cycles." This material is related to Perle's own method of composing which he calls twelve-tone tonality.

Philips, Joel. "The Atonal Middleground: Pitch Organization and Structural Levels in Berg's String Quartet Op. 3 (1910)." Unpublished paper delivered at the national meeting of the Society for Music Theory on November 5,1988 in Baltimore, MD.

This is an analysis of the first movement of Opus 3 based on

pitch collections listed by Allen Forte in The Structure of Atonal Music. The paper fails to consider voice-leading and also does not convincingly present a real middleground. At best it is a highly problematical effort.

Porter, Charles. "A Discussion of Voice-leading and Harmony in Alban Berg's String Quartet Opus 3/I." unpublished paper, 1982.

A detailed discussion of bars 48-81 of the first movement of Opus 3 which demonstrates how a polyphonic melody of interval cycles exists in individual instrumental parts and also contains a prelimnary attempt at analyzing the harmonic content of these bars. Nine pages of text and five pages of musical examples.

Redlich, H. F. *Alban Berg.* Universal Edition, Wien-Zurich-London, 1957.

Attempts to show similarities between selected themes in Berg's Opus 3 and those of R. Strauss, Wagner, and Schoenberg through intervalic and contour comparisons, pp. 64-71. Written in German.

Rockmaker, Jody. "A Missing Link: The Sketches for Two Incomplete String Quartets by Alban Berg." Unpublished paper delivered at the national meeting of the Society for Music Theory on November 5,1988 in Baltimore, MD.

Berg worked simultaneously on the Opus 2 songs and the Opus 3 quartet. These two incomplete string quartet sketches (the first consists of twenty-one bars and the second thirty-four bars) are found among the Opus 2 and Opus 3 materials. The paper presents these sketches for the first time and compares them to Opus 2/II and Opus 3/I. Certain formal, harmonic, and melodic similarities are found.

_____. "The role of pitch in the articulation of form: Alban Berg's String Quartet, Opus 3 and its sketches." Unpublished paper delivered at Society for Music Theory meeting in November of 1987 in Rochester, NY.

This paper is based on a PhD dissertation in progress at Princeton University. It contains an analysis of the exposition of the first movement which demonstrates how a series of underlying pitch centers articulate the form. It further shows how motives are used to reinforce these centers. Rockmaker draws on the sketches and manuscripts of the quartet, which include several layers of pasteovers, to support his analysis. In addition to a schematic diagram of the sonata-form of the movement through reference to motives there is also a Schenkerian style graph of linear motion between important pitch centers in the first forty bars. Twelve pages of double spaced text and five legal sized pages of examples. The completed dissertation will be the first detailed accounting of the sketches and manuscripts of Opus 3.

Samson, Jim. "Atonality and tradition." In his *Music in Transition: A Study of Tonal Expansion and Atonality, 1900-1920.* Dent, London, 1977, pp. 155-75.

A Schenkerian style graph of the background level of the second movement of Opus 3 demonstrates that its tonal center is D which is implied by its semitonal neighbor-notes C-sharp and E-flat. Contains one paragraph of relevant text, pp. 159-60. A harmonic reduction of the first movement coda demonstrates the consistent use of a 7/3 sonority. One paragraph of relevant text, p. 163.

Schoenberg, Arnold. "The Teacher's Testimonial." In Willi Reich's *Alban Berg*, trans. Cornelius Cardew, Thames and Hudson, London, 1965, pp. 28-30.

Schoenberg here cites the musical excellence of Berg's Opus 3 and makes observations on Berg's work in general and on his own relationship with him.

Schweizer, Klaus. *Die Sonatensatzform im Schaffen Alban Bergs*, Musikwissenschaftliche Verlags-gesellschaft, Stuttgart, 1970.

This and the Archibald dissertation are the most comprehensive large-scale Opus 3 analyses of those listed here. The chapter on Opus 3, pp. 74-85, contains a demonstration of the pitch and intervalic connections between the principal themes of the two movements, a chart illustrating thematic transformations and labeling important themes in both movements, and a foldout page which diagrams the sonata-form of the first movement and the rondo form of the second. This diagram shows important themes and sections by measure number within each movement. Written in German.

Turner, J. Rigbie. "Nineteenth-Century Autograph Music Manuscripts in the Pierpont Morgan Library: A Check List." *19th Century Music*, 4 (1980), pp. 49-69.

Catalogues scores of Berg's *Early Songs, Schliesse mir die Augen beide, I and II, Im Zimmer* from *Seven Early Songs*, and the *String Quartet, Op. 3.*

von Rauchhaupt, U., *Schoenberg/Berg/Webern, Die Streichquartette--eine Dokumentation. Briefe - Aufsatze - Vortrage - Bilder - Skizzen.* Trans. Eugene Hartzill, Munchen, Ellerman, 1972.

This volume was originally issued with the complete recording of the string quartets of Schoenberg, Berg, and

Webern by the La Salle String Quartet, DG 2561-050--DG 2561-054 (LP 5157 Neue Wiener Schule). It contains a brief general disscussion of Opus 3 and a photo of one page of the manuscript.

Zeller, Hans Rudolf. "Text und Interpretation: Zur Handlungsanalyse von op. 3." In Metzger and Riehn, *Alban Berg Kammermusik II*, pp. 38-48.

Discusses I1A in some detail tracing its constant variation in the first movement through rhythmic, articulative, and dynamic transformations. Points out that I1A is the rhythmic source for IIF, the ostinato figure of II mm. 65-73, and the arpeggio of II m. 53 violin I. Contains twelve short musical examples and is written in German.

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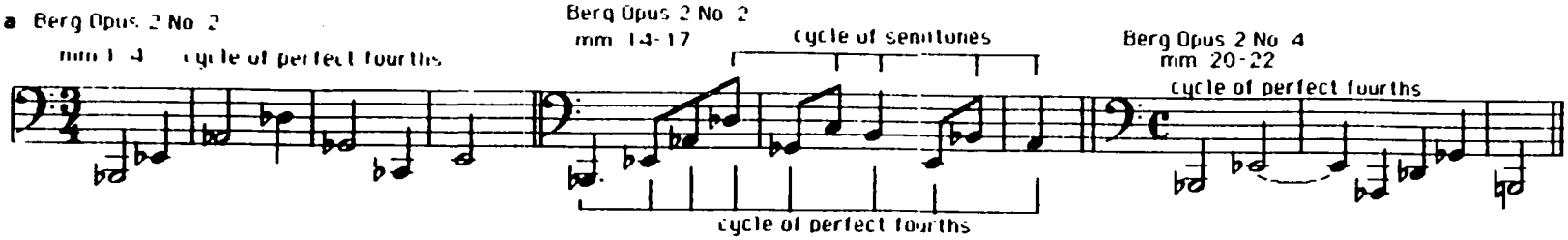
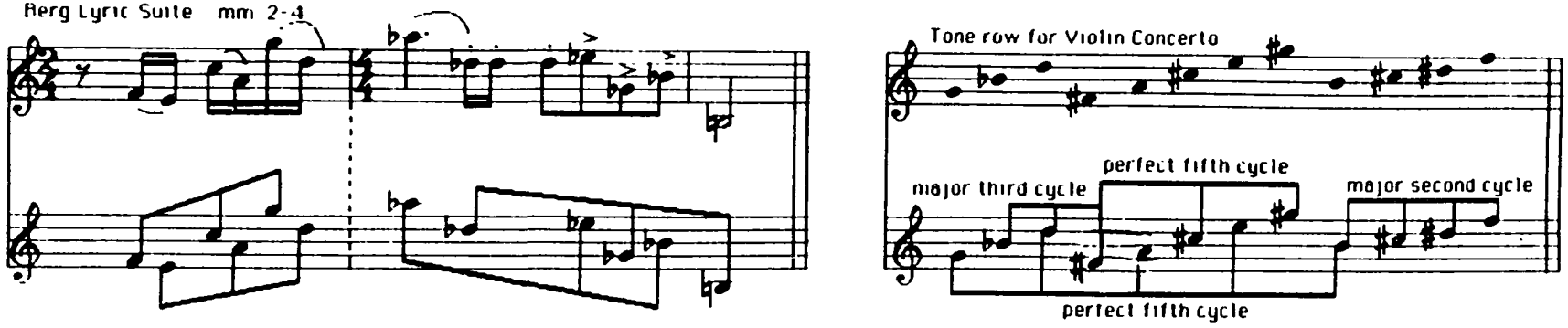
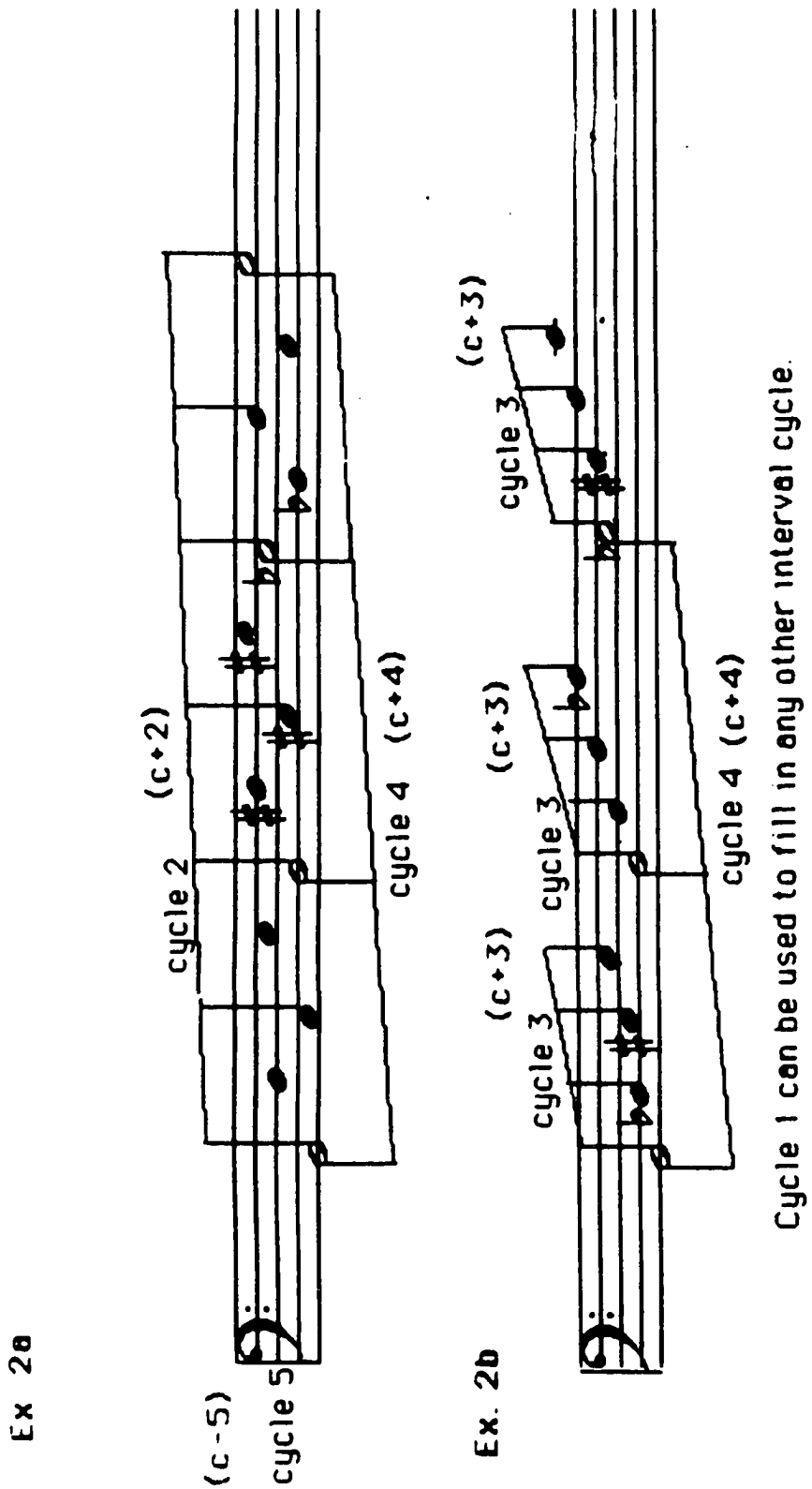
Ex 1a Berg Opus 2 No 2

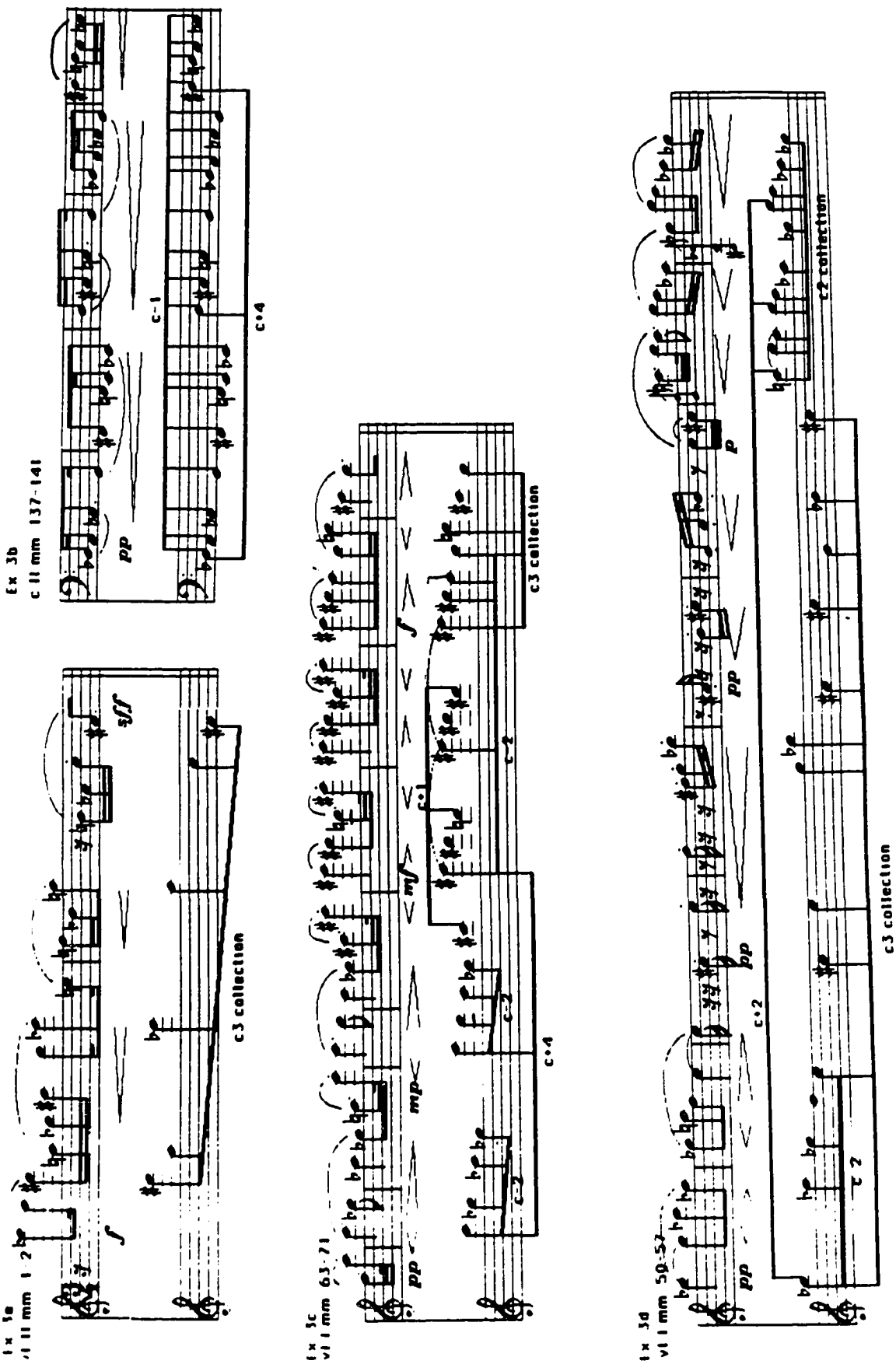


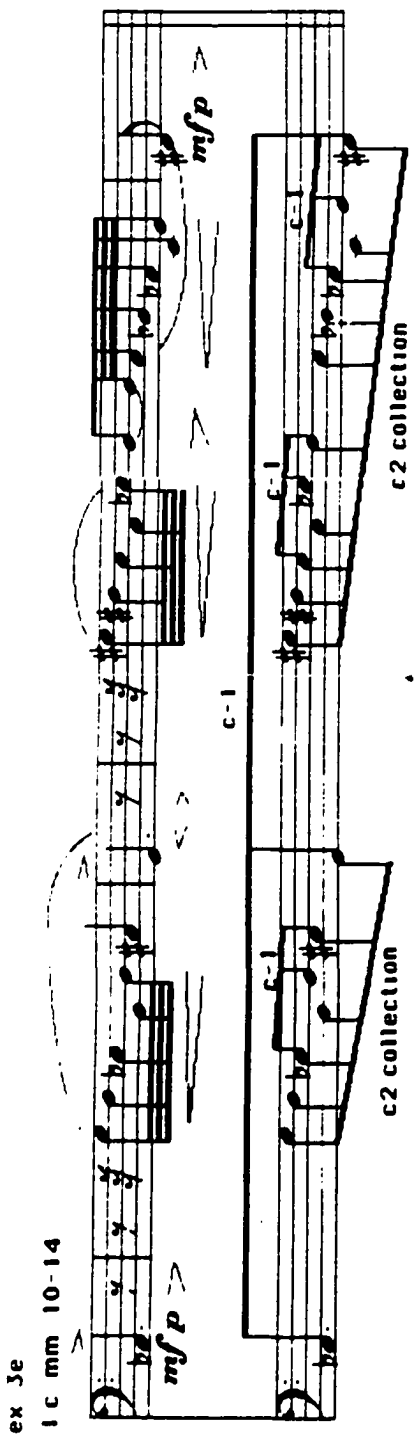
Ex 1b

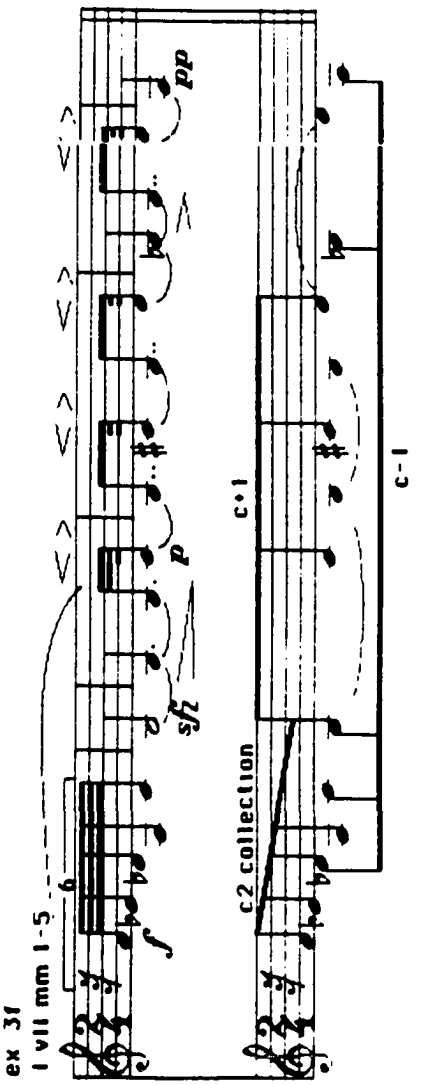


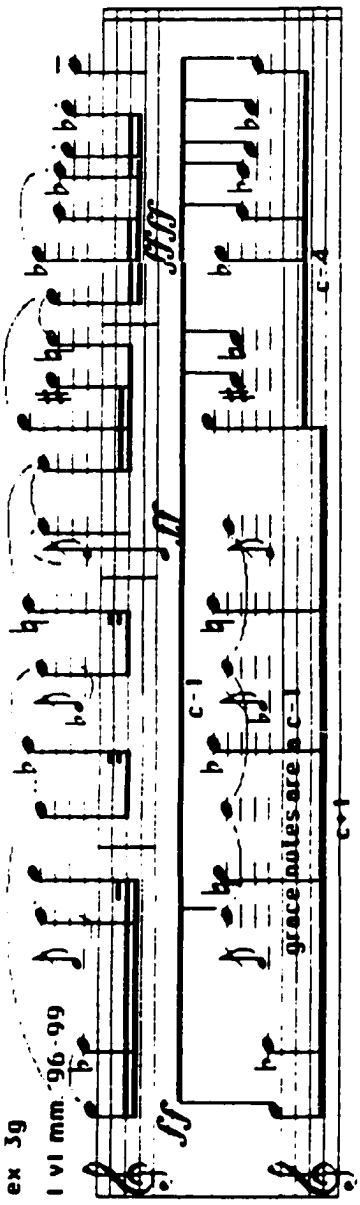
Two six-note partitions which each consist of two three-note segments of inversionally related perfect fifth cycles

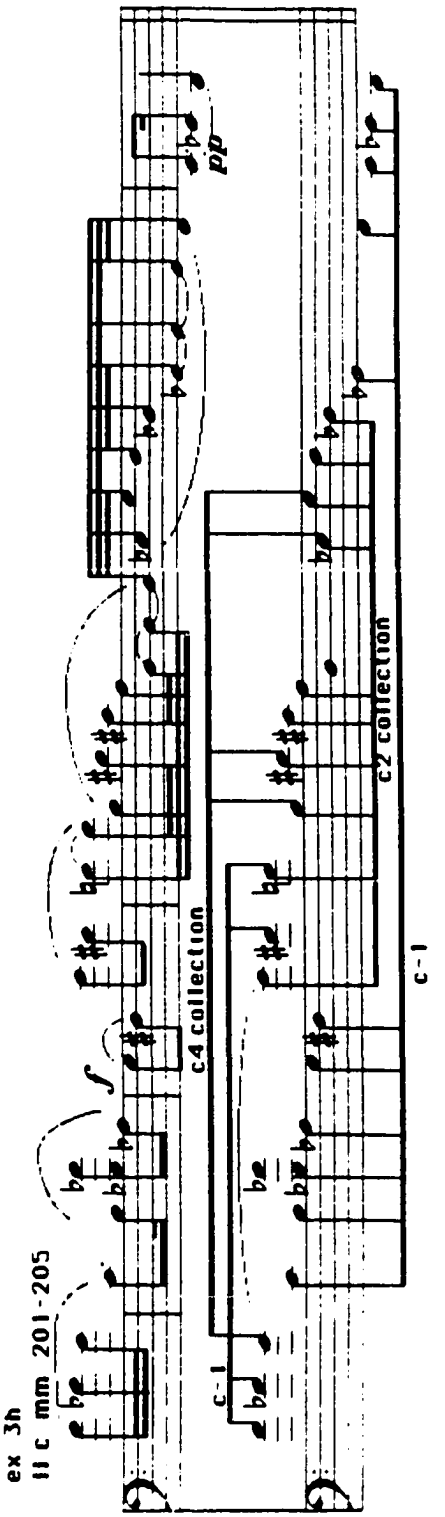


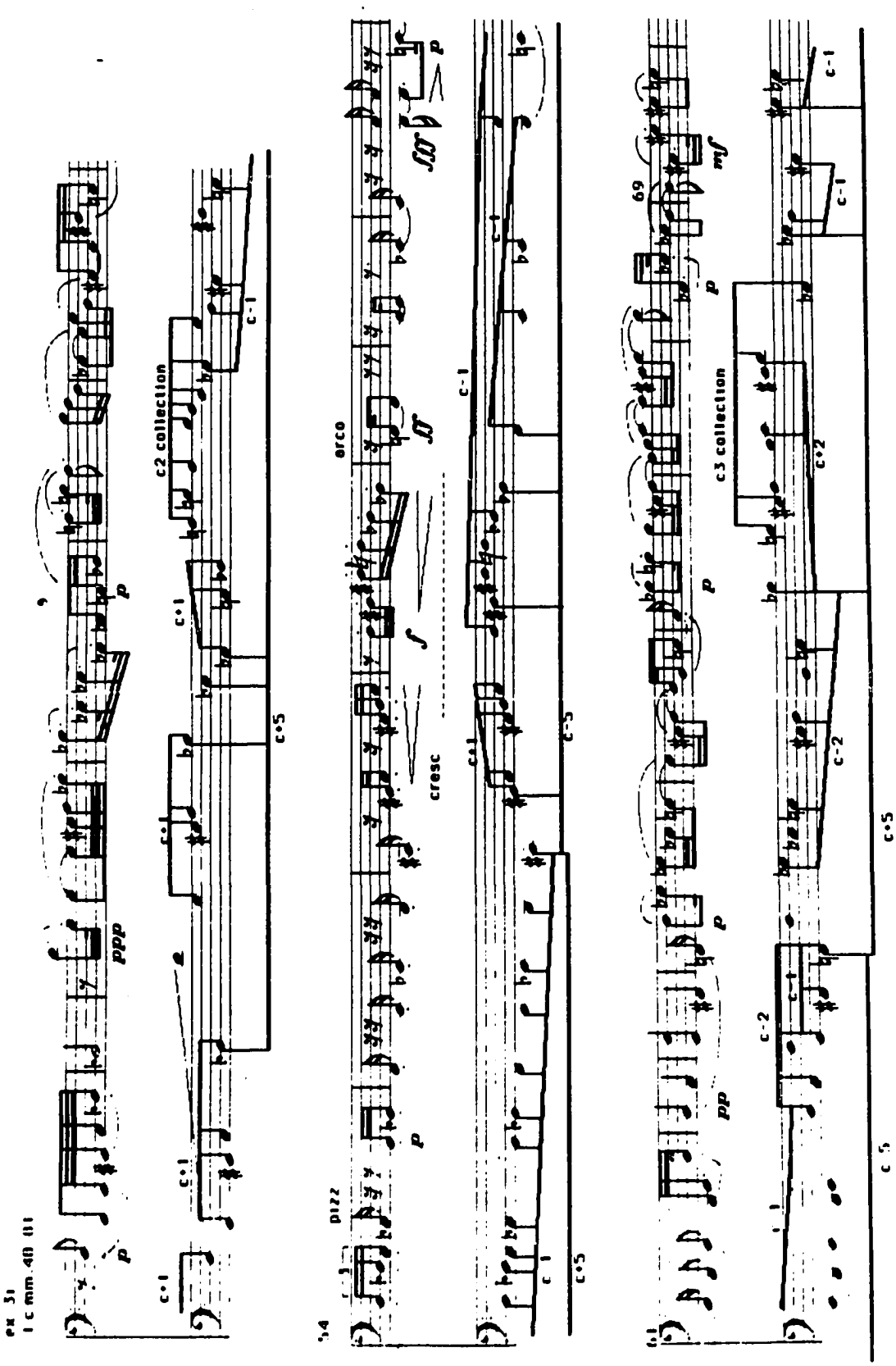




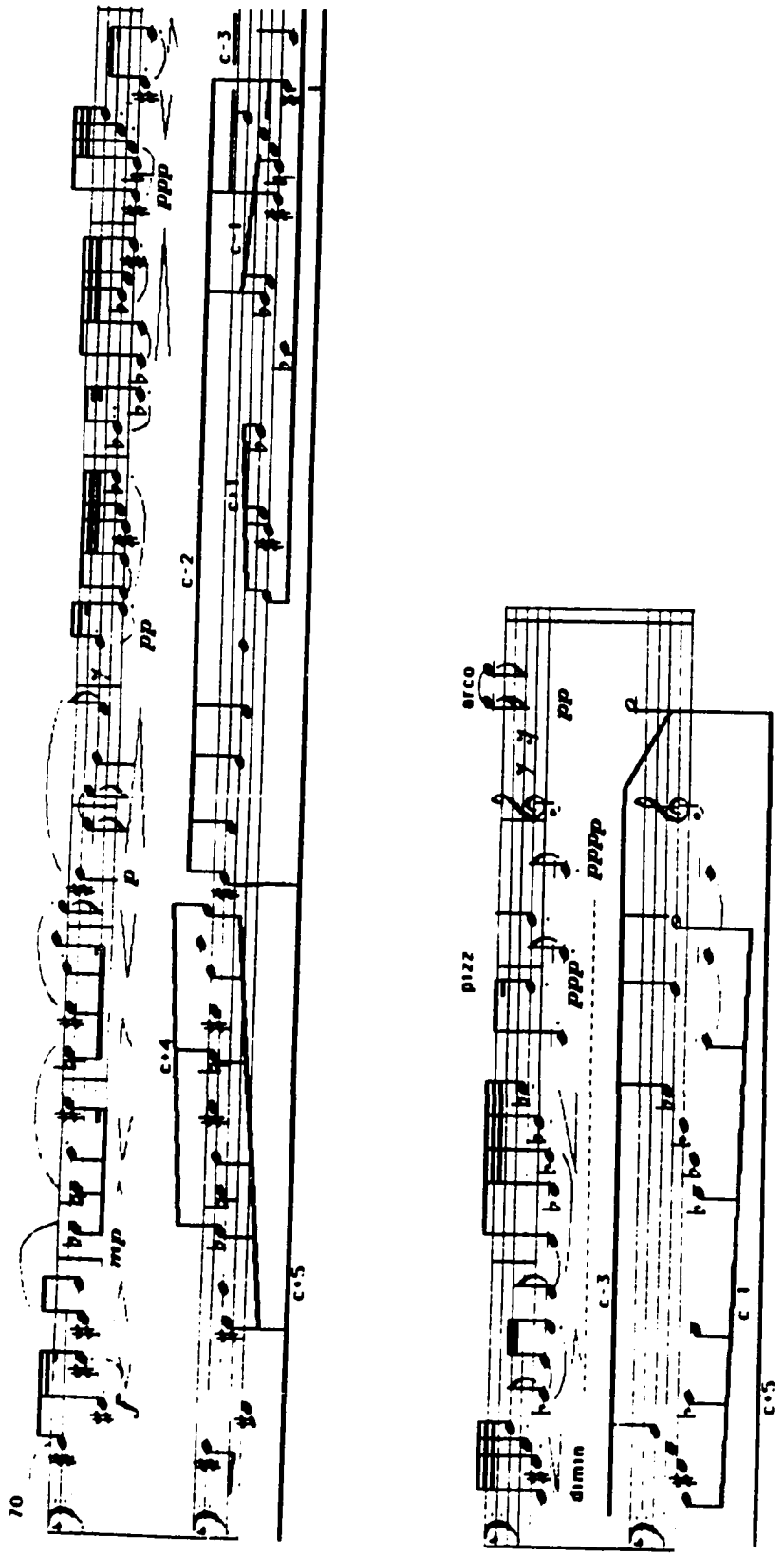


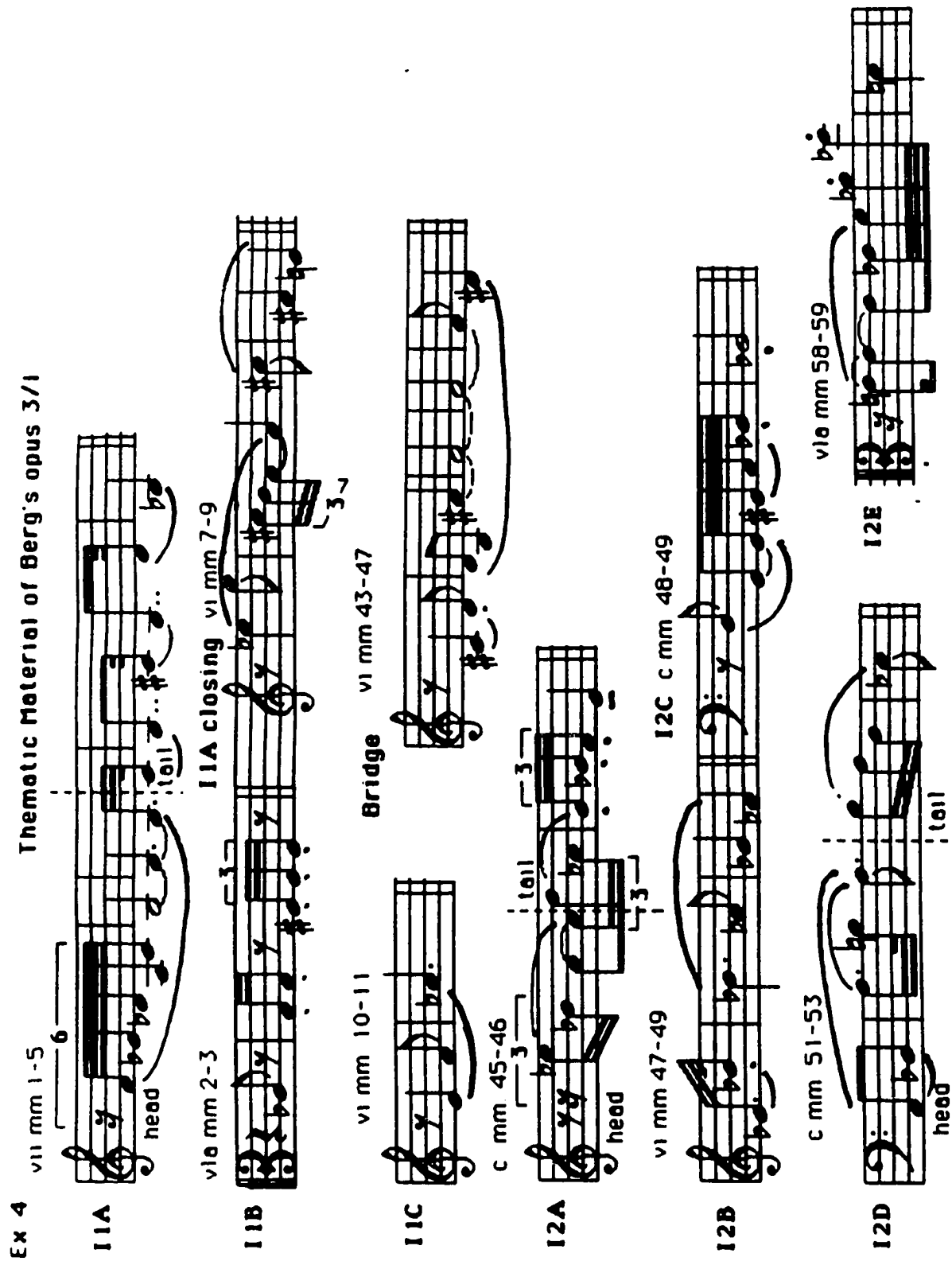




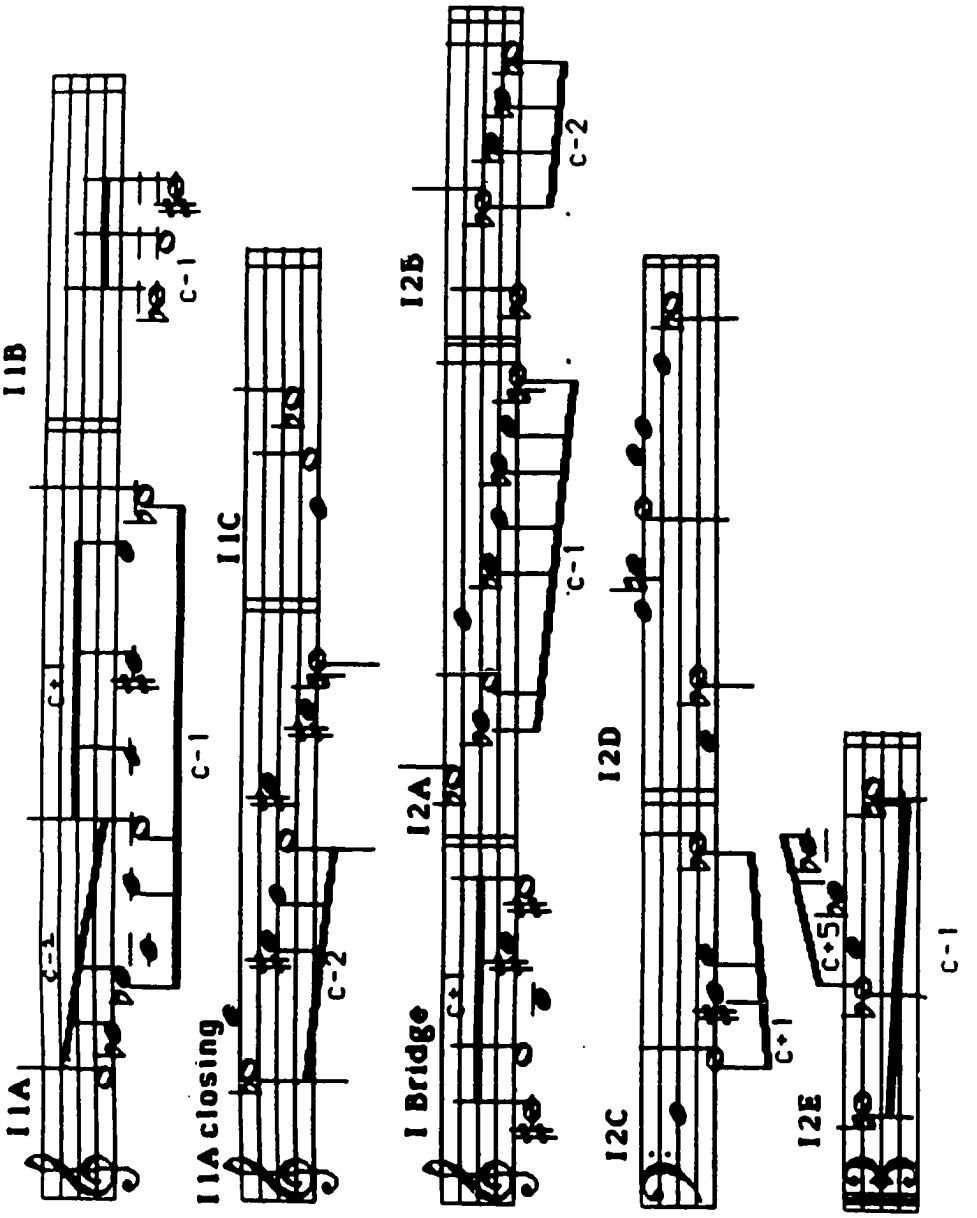


Ex 3: continued

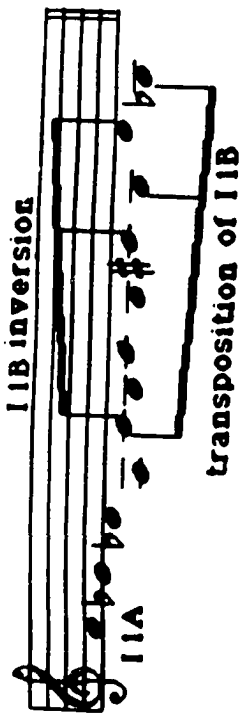




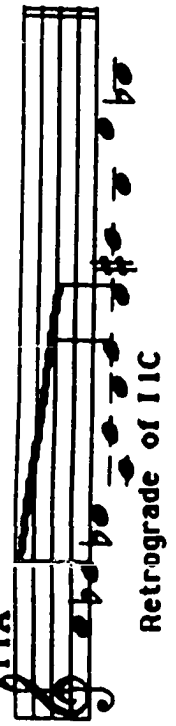
Ex. 5



Ex. 6a



Ex. 6b



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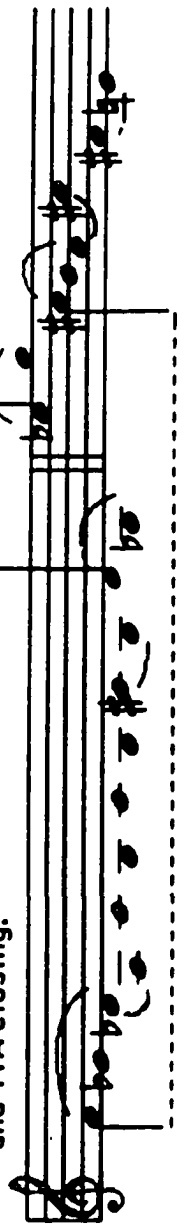
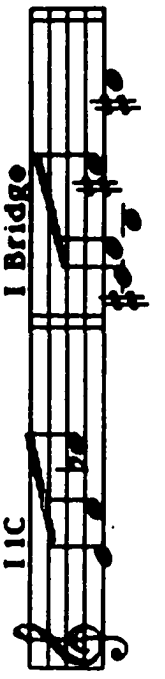
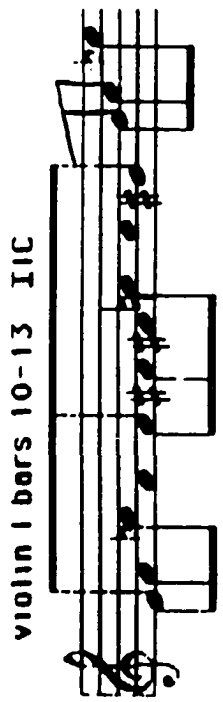


Ex. 7b



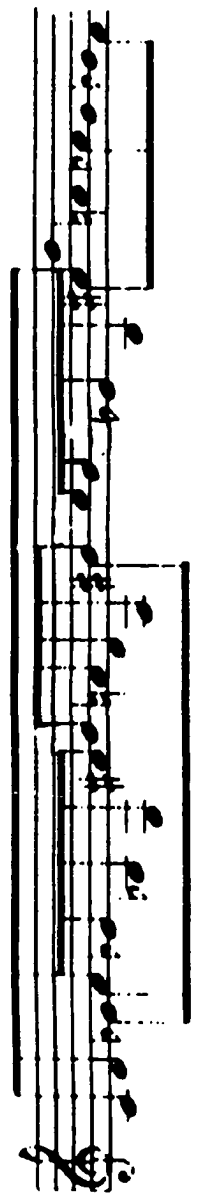
Ex. 8a

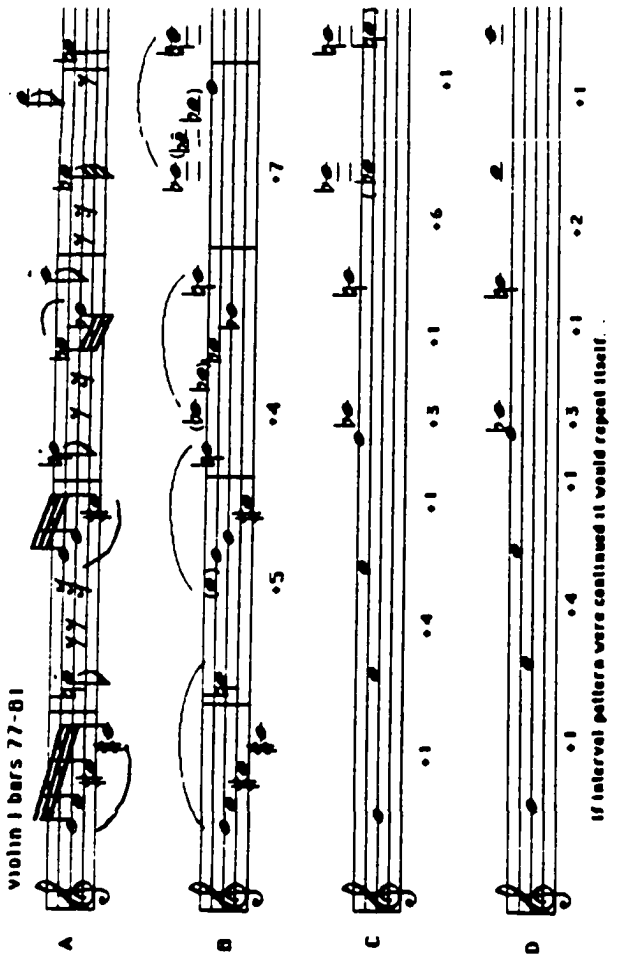
violin I bars 10-13 IIC



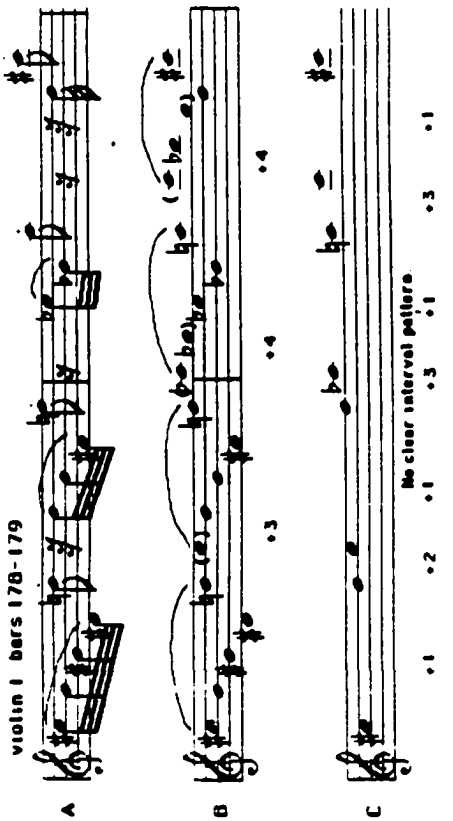
Ex. 8b

violin II bars 95-100 I2E

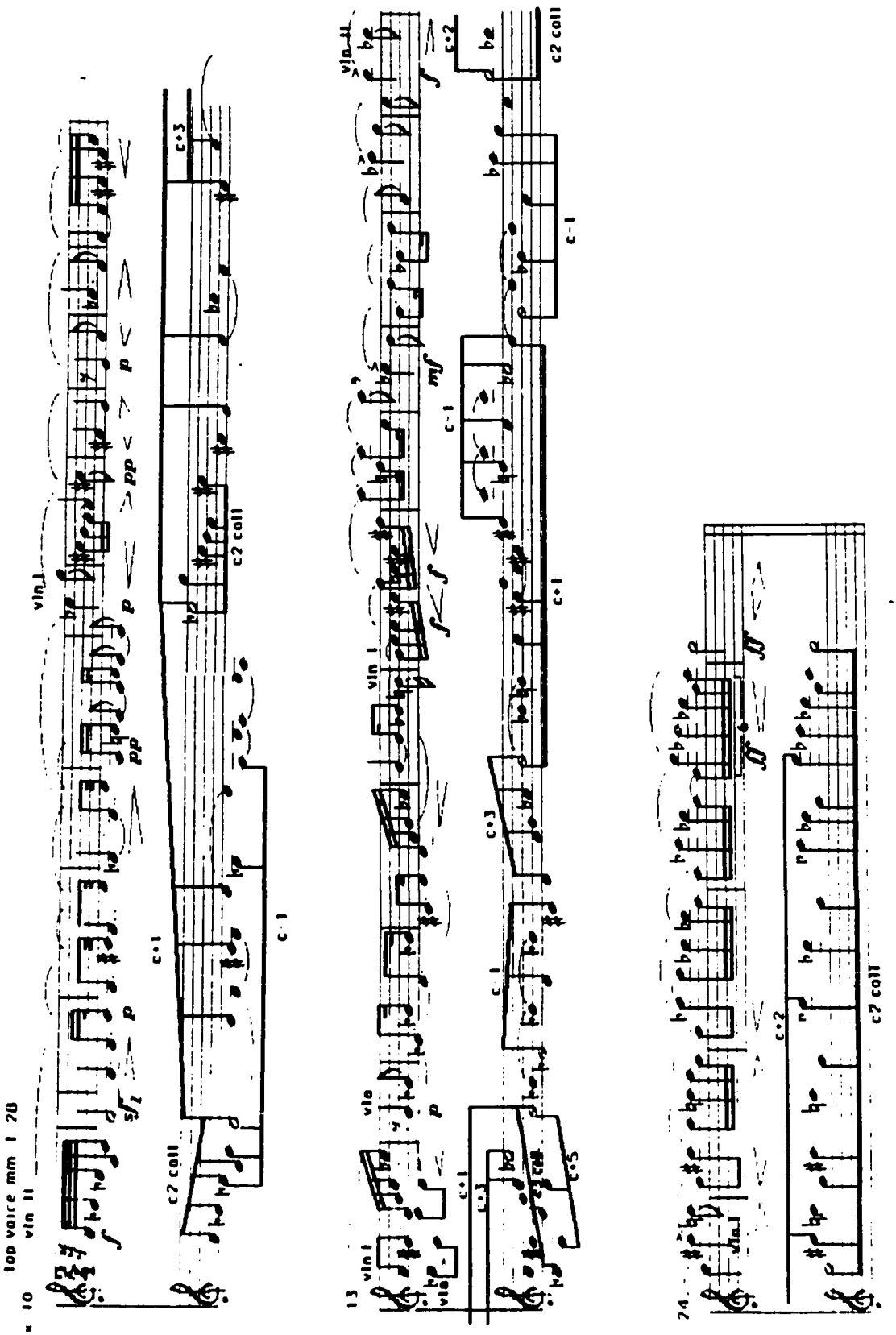




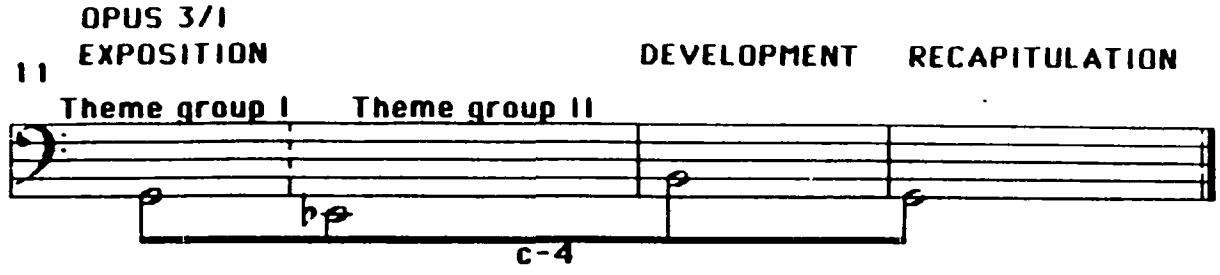
Ex 9a



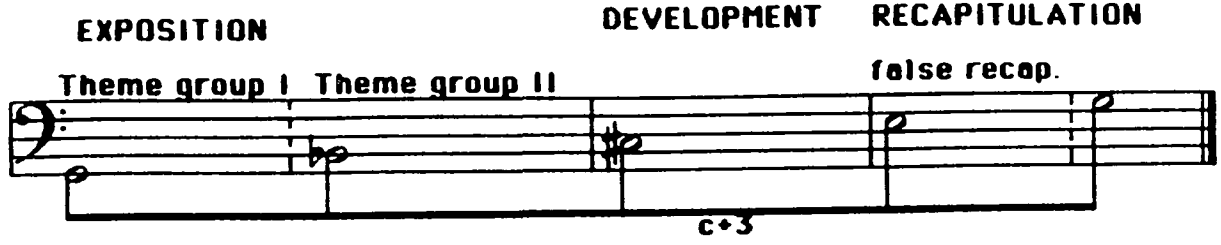
Ex 9b

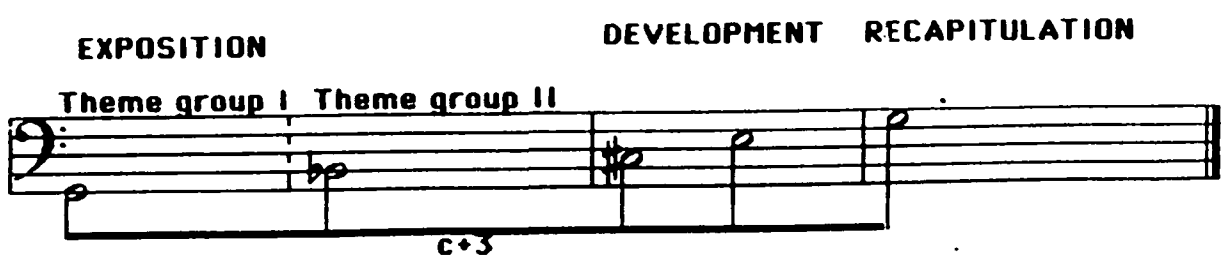


Ex 11

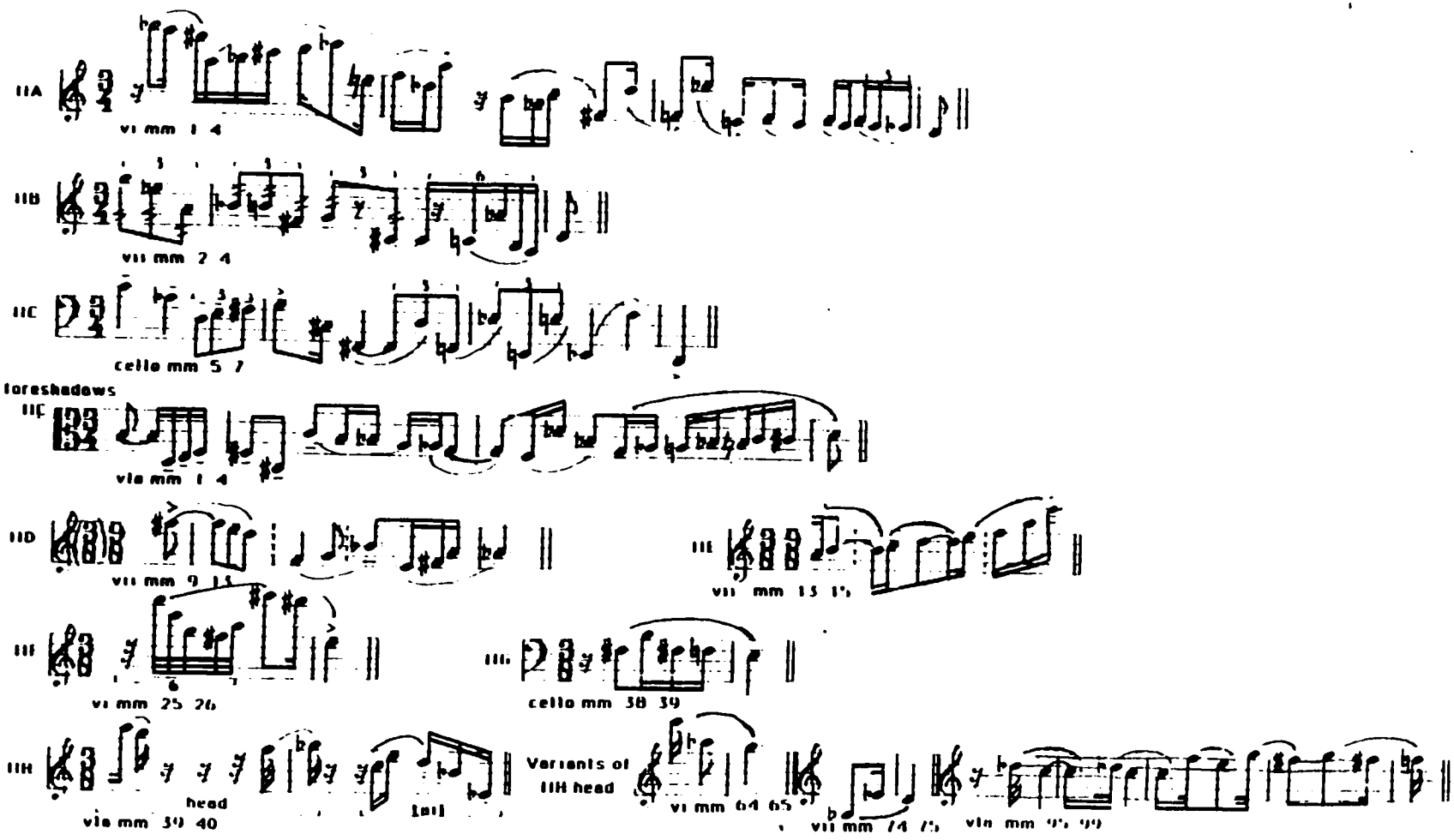


Two possible ways an interval-3 cycle might be used to articulate sonata form.

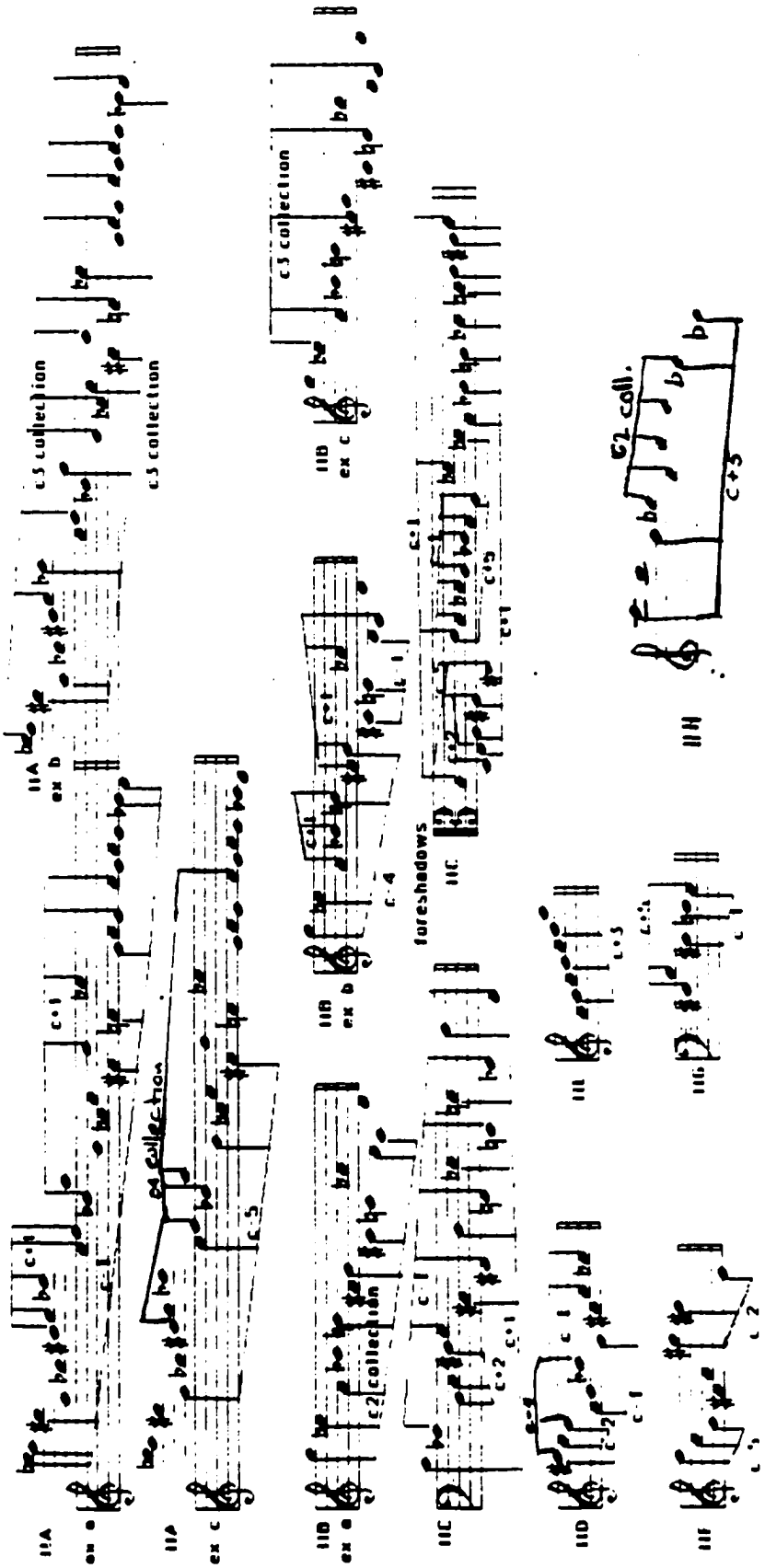


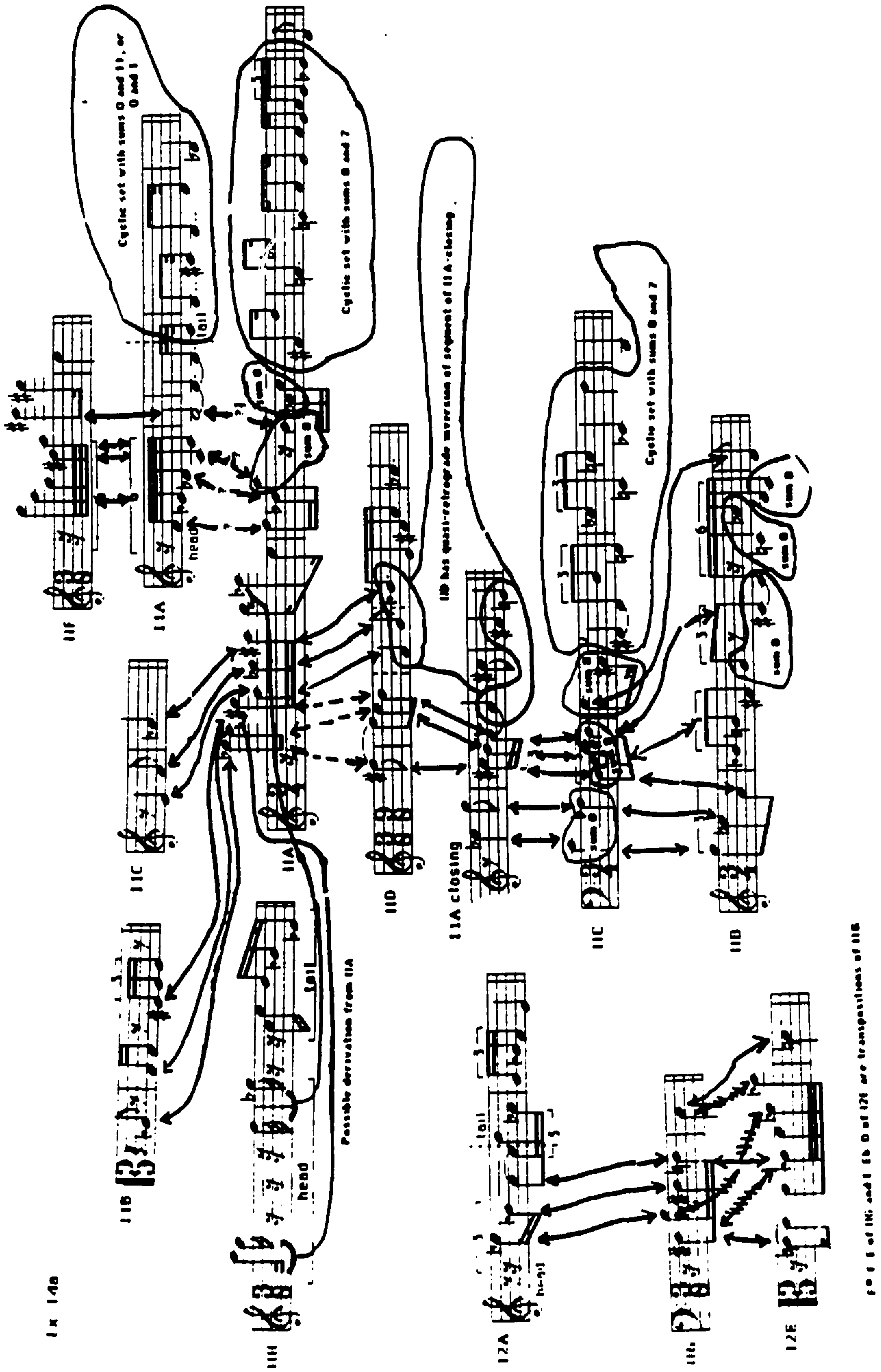


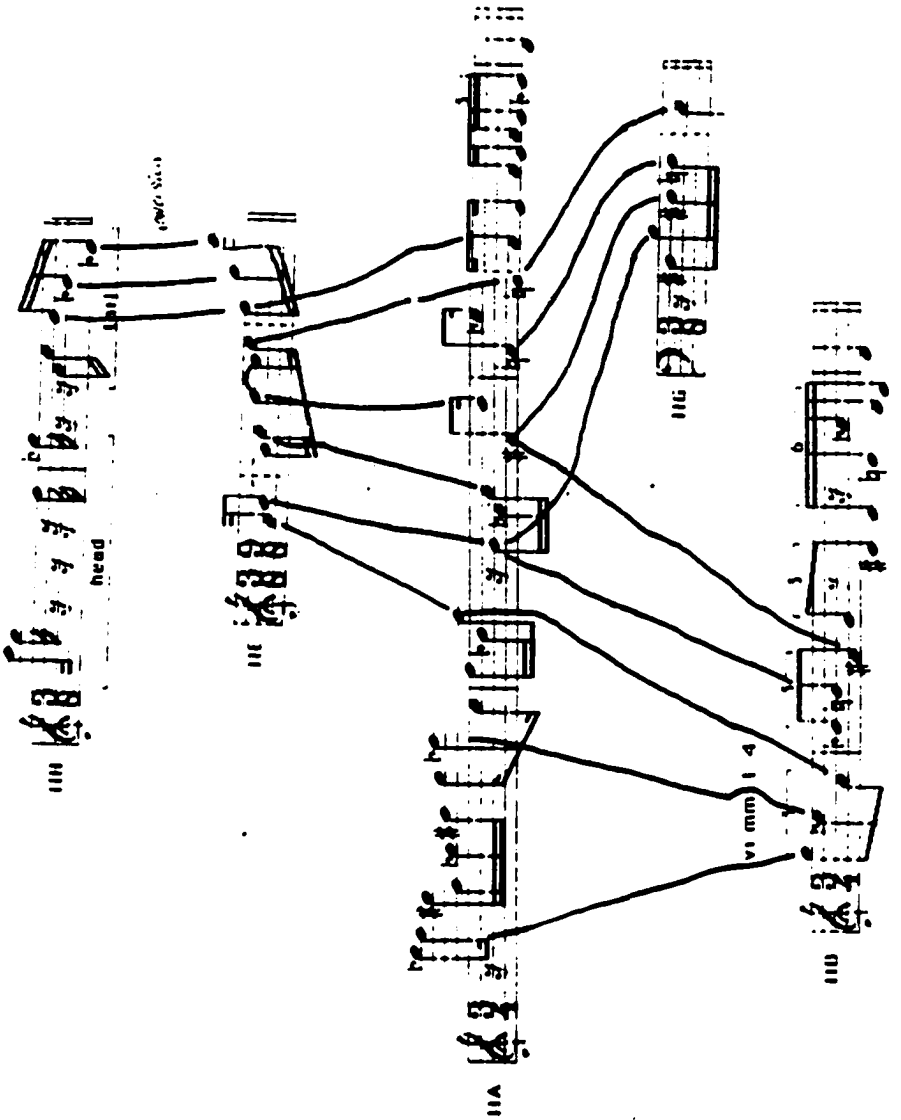
Ex 12 Second Movement Themes



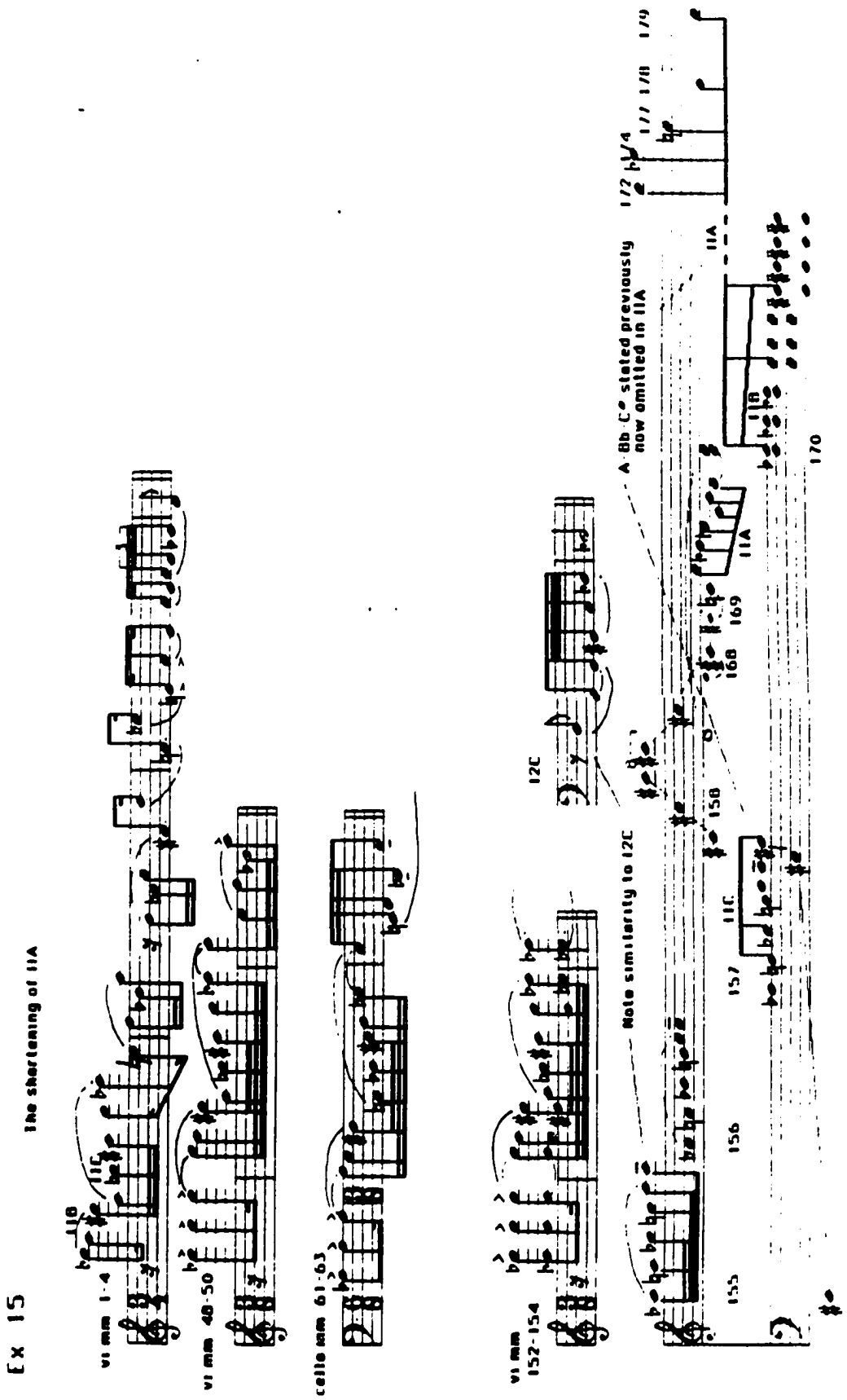
Ex 13 Cyclic Content of Second Movement Themes

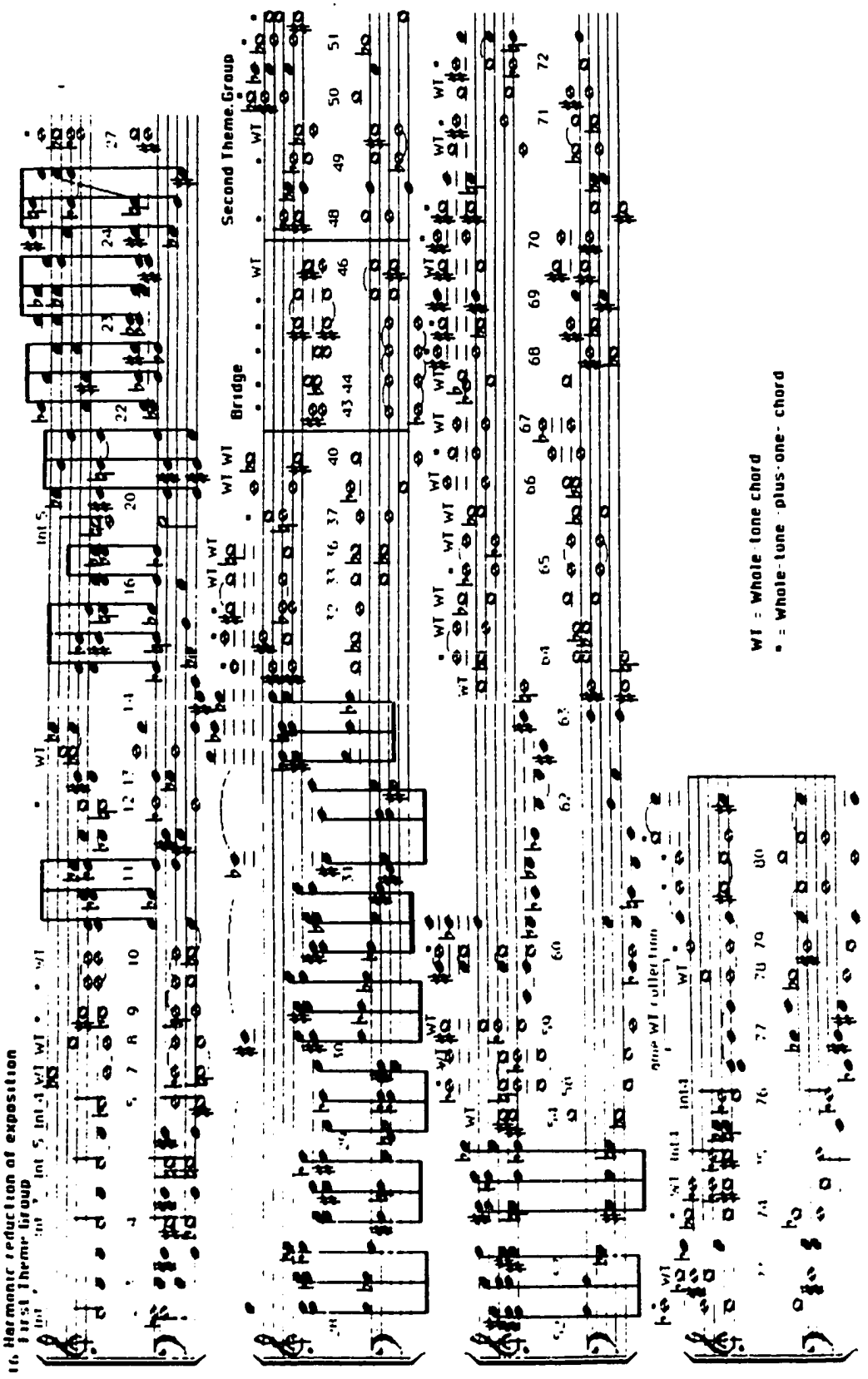


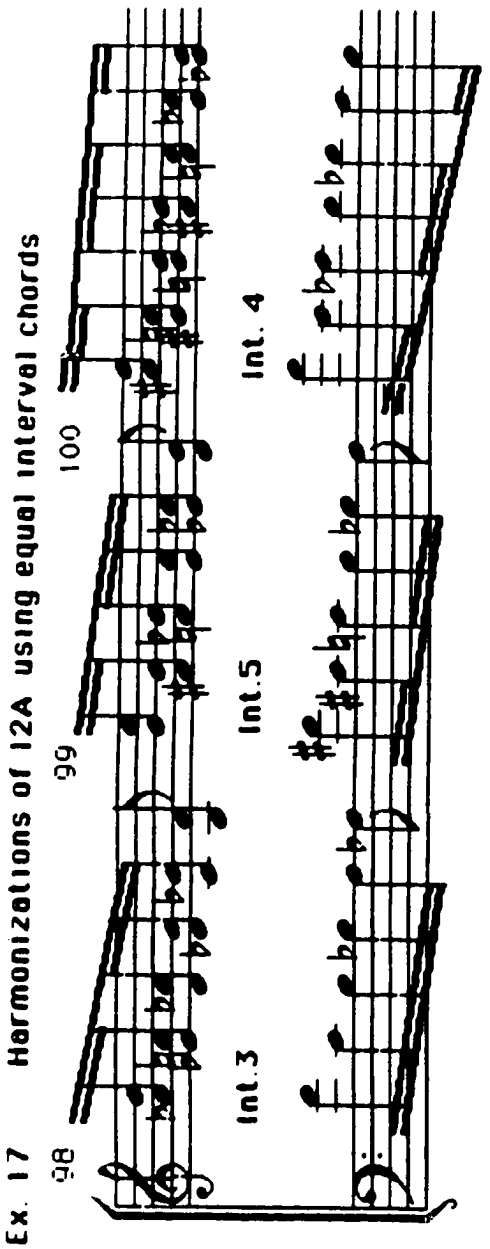




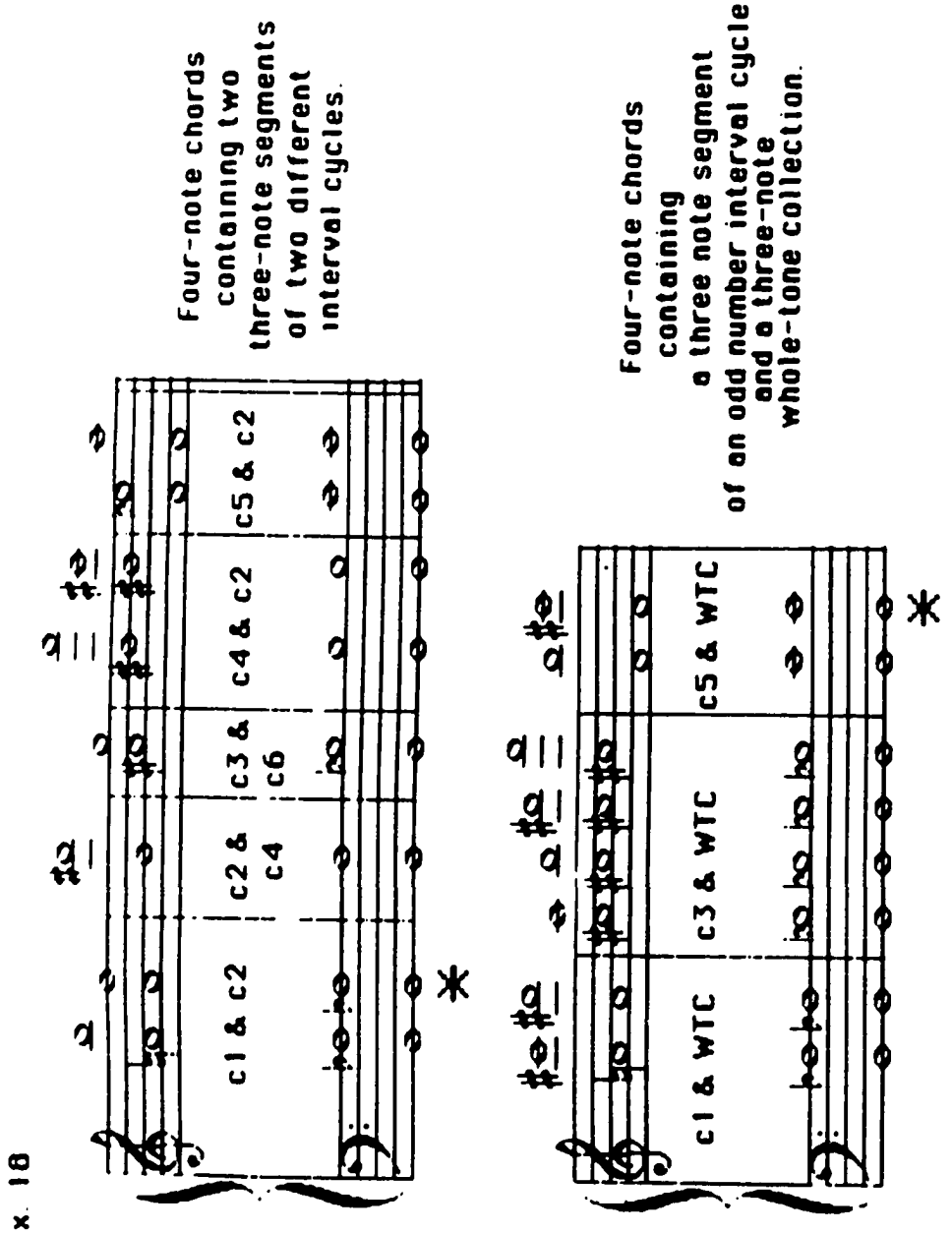
Ex 14b

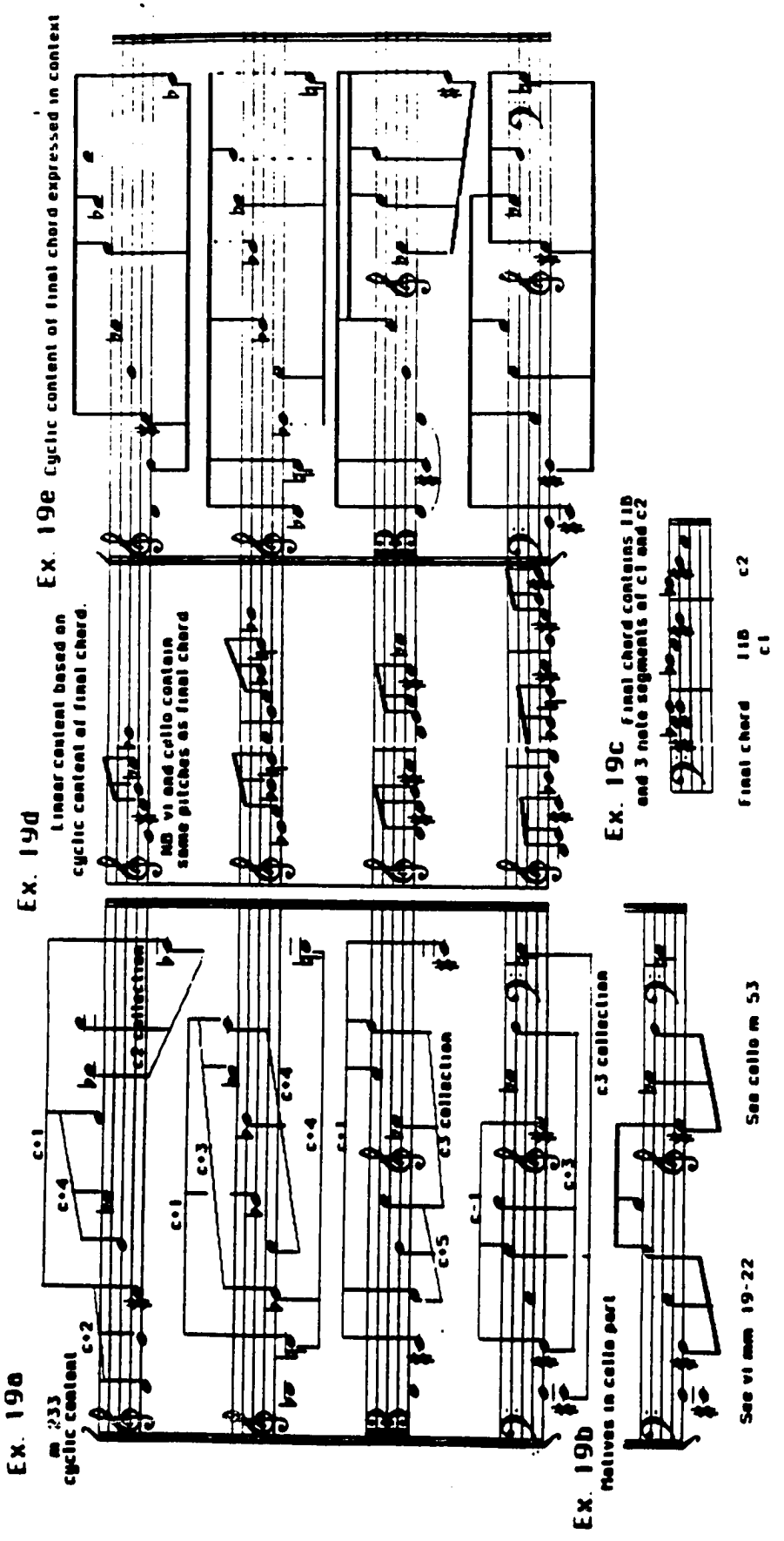


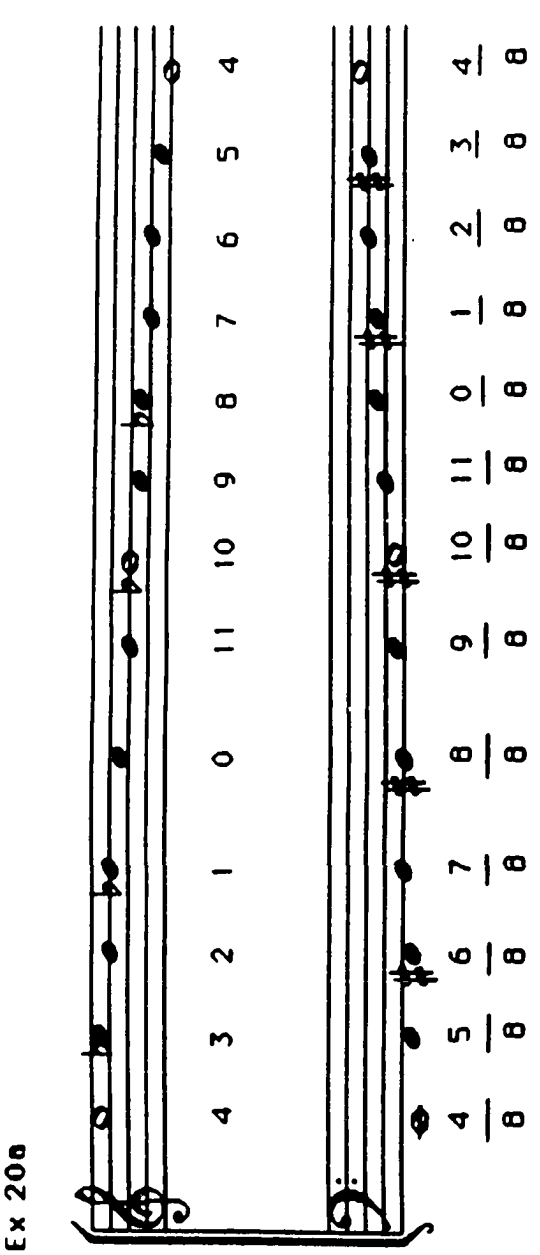


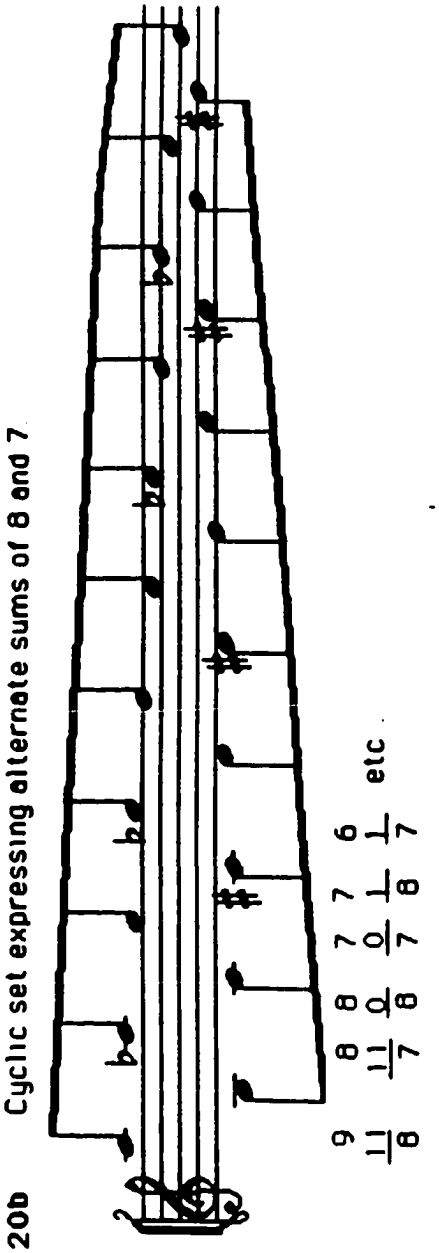


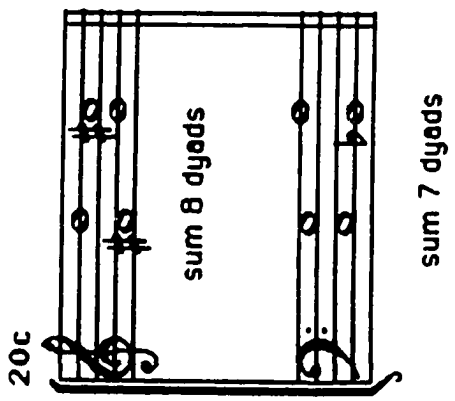
Ex. 18





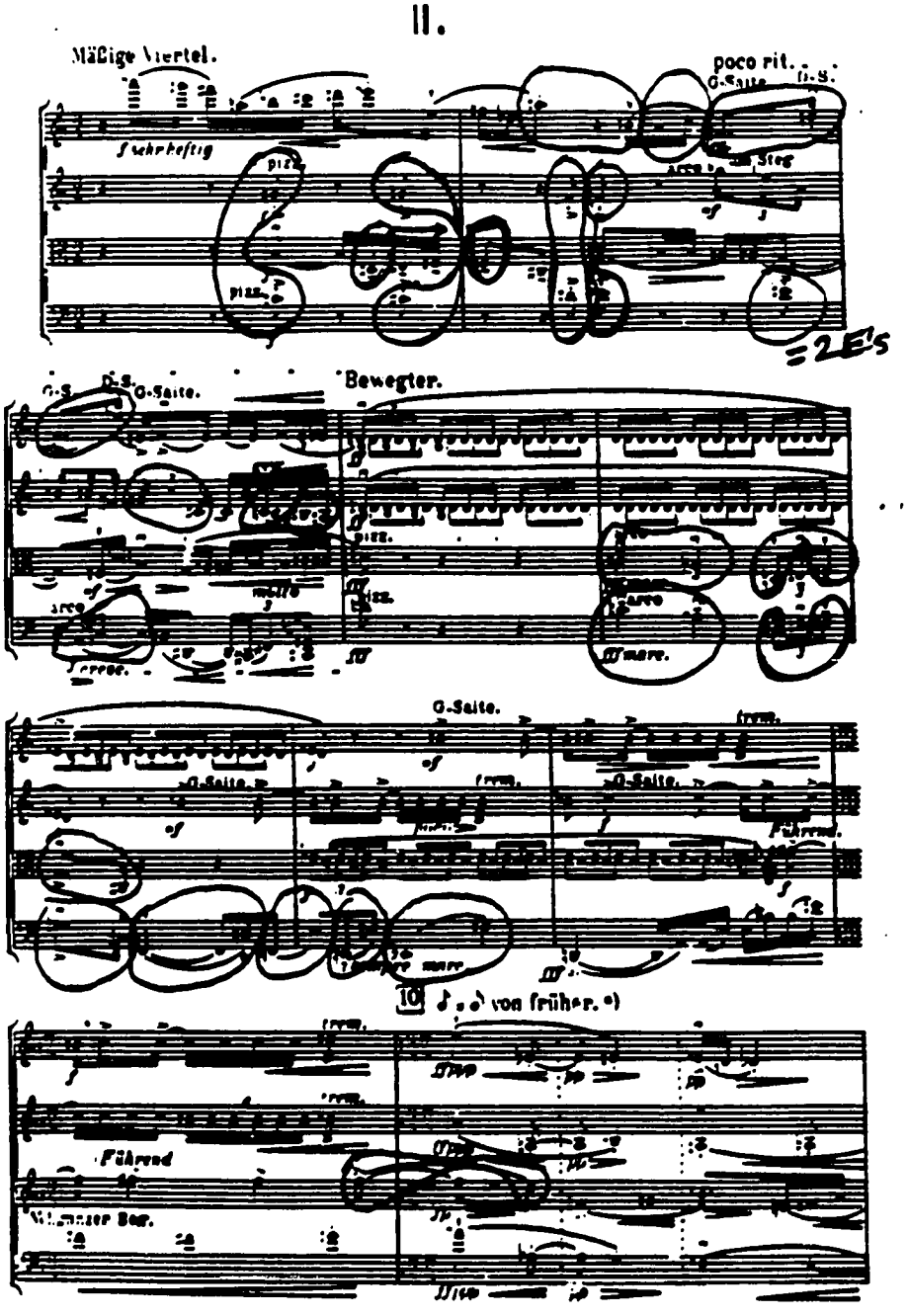






Ex. 20c

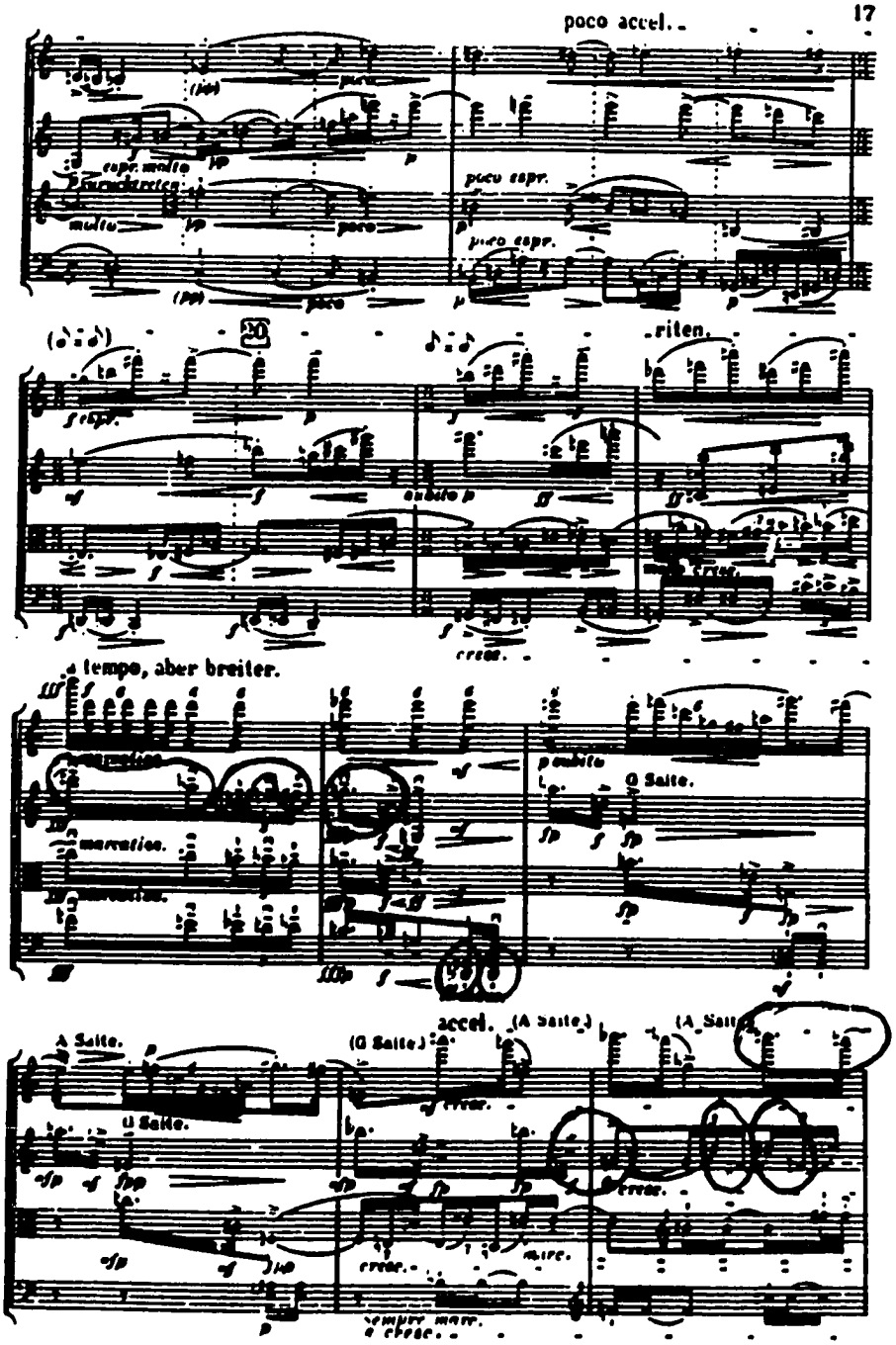
Ex. 21



*) Der halbe ¾ (resp. 6/8) Takt ist gleich dem ganzen ¾ Takt, so dass die Achtel, wie auch im Folgenden, gleich bleiben.

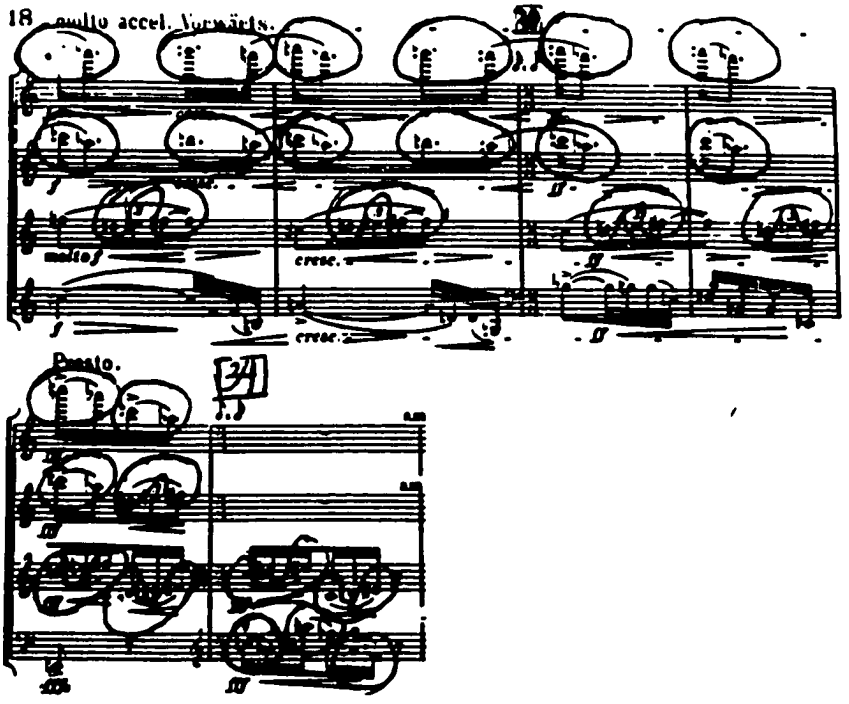
U E 7537

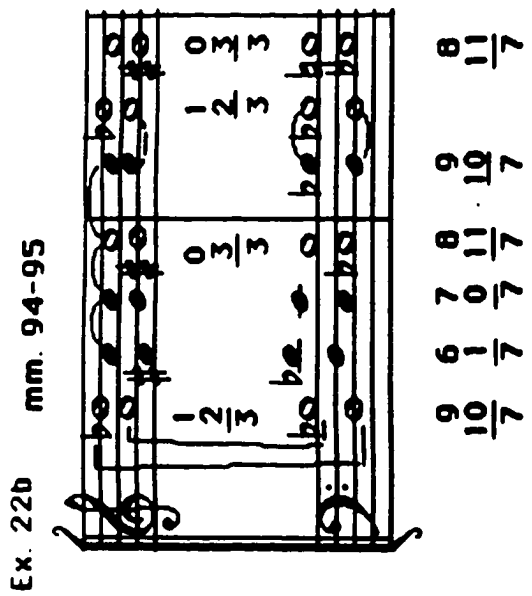
Ex. 21 continued



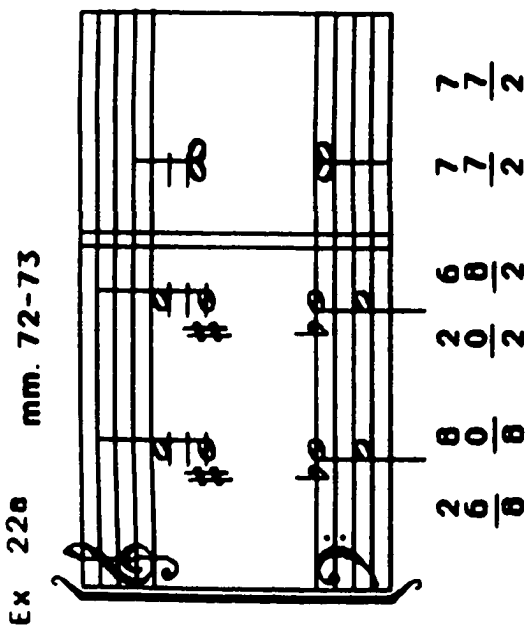
U. E. 7537

Ex. 21 continued

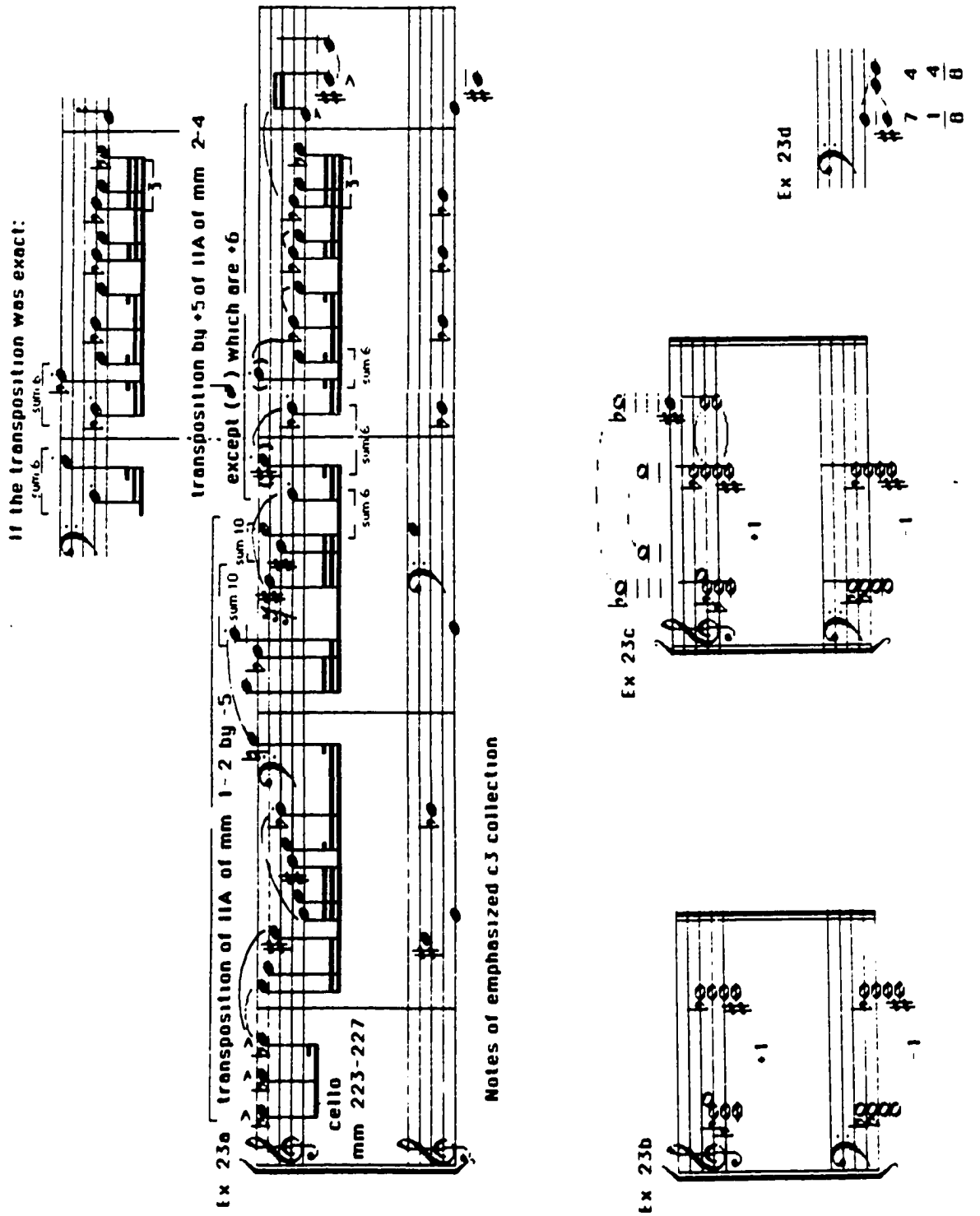


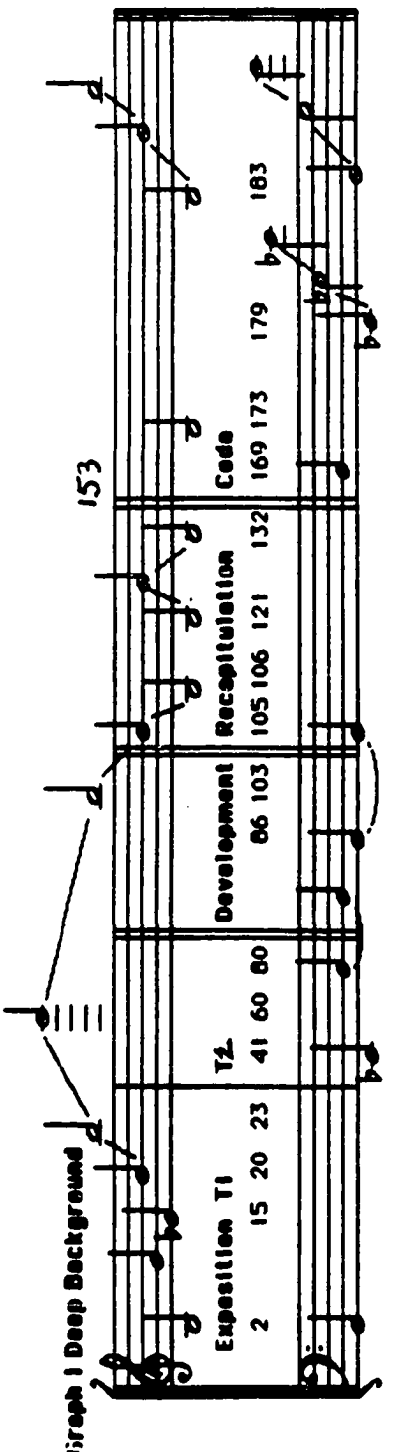


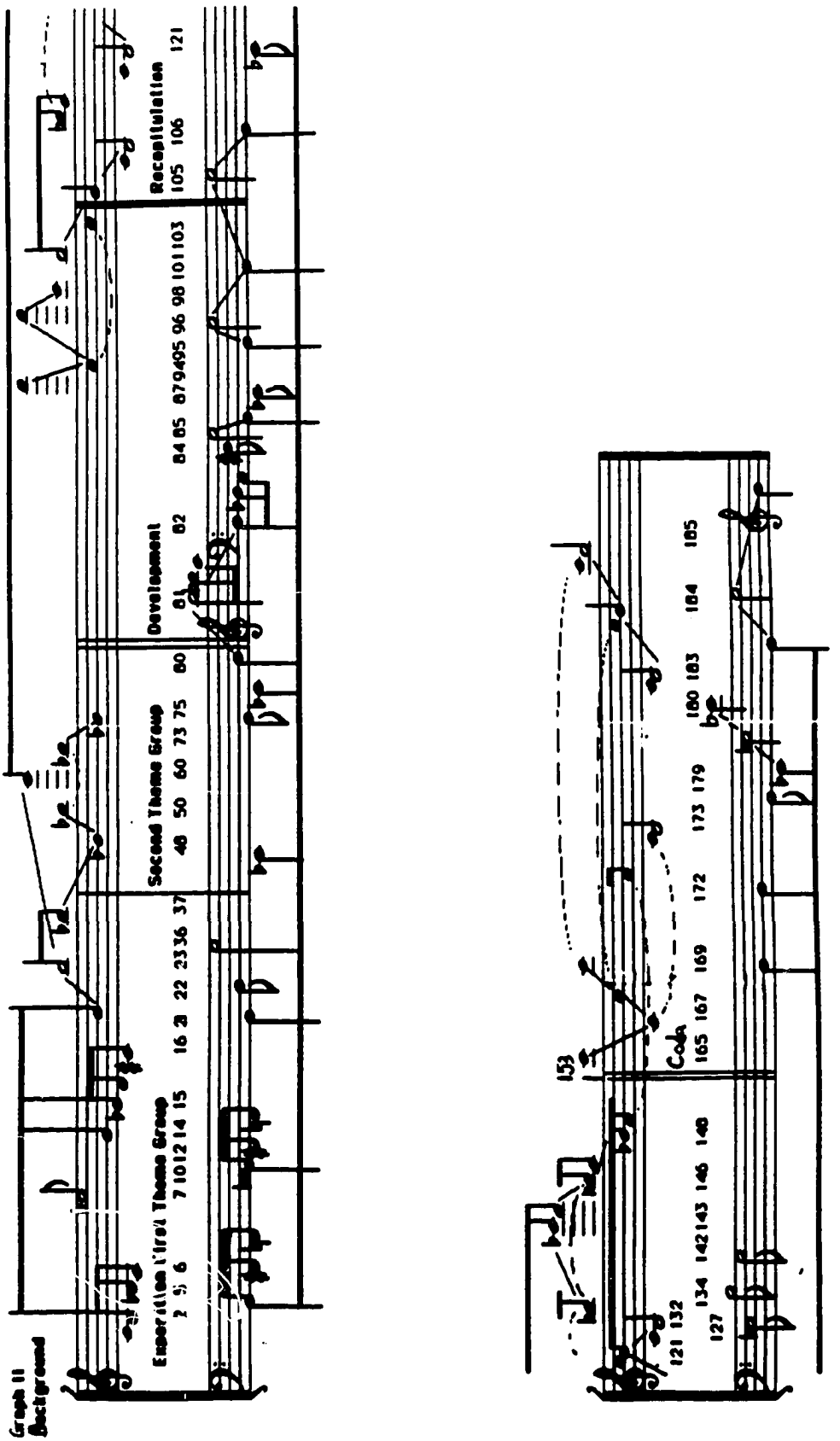
Ex. 22b mm. 94-95

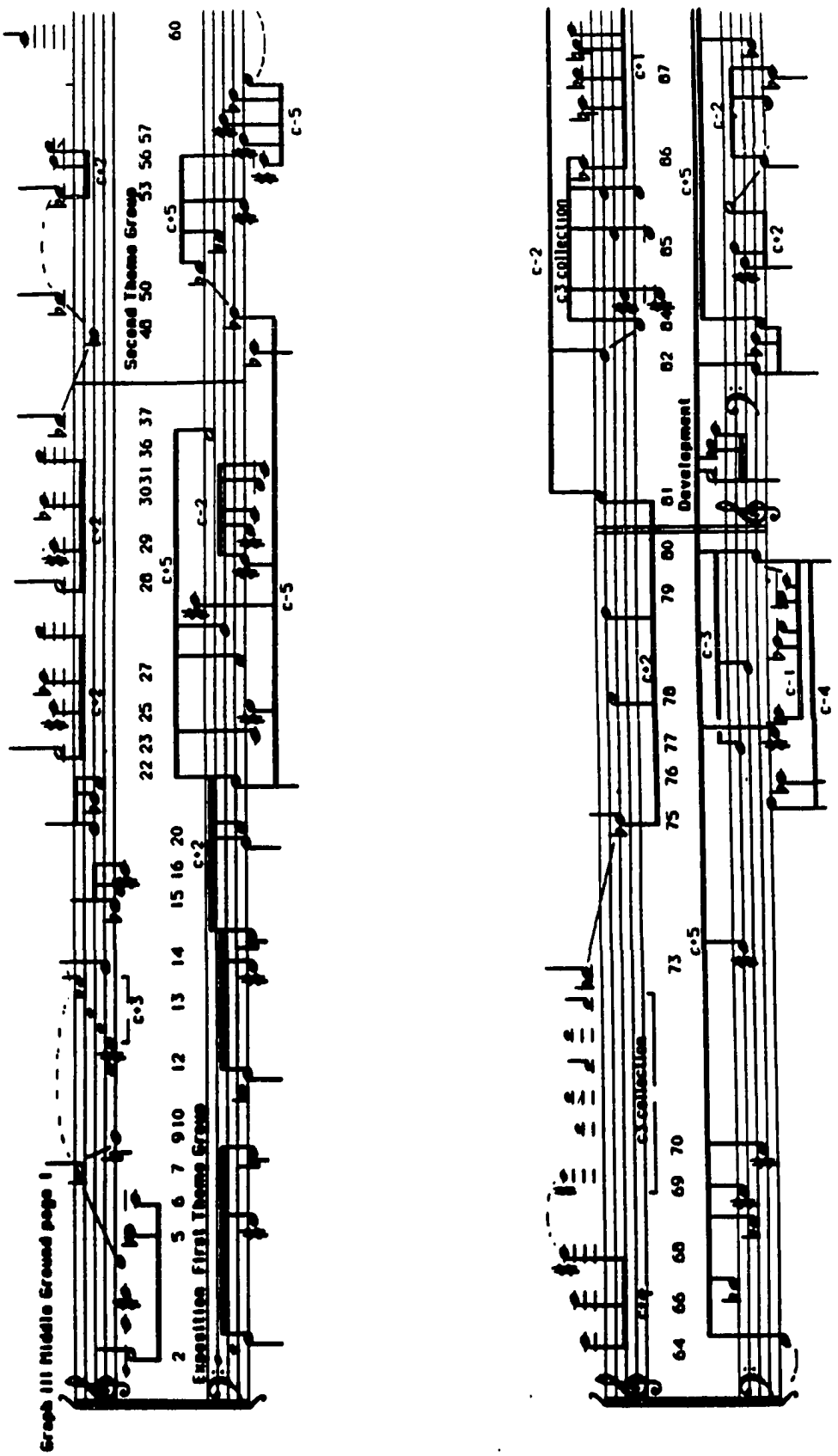


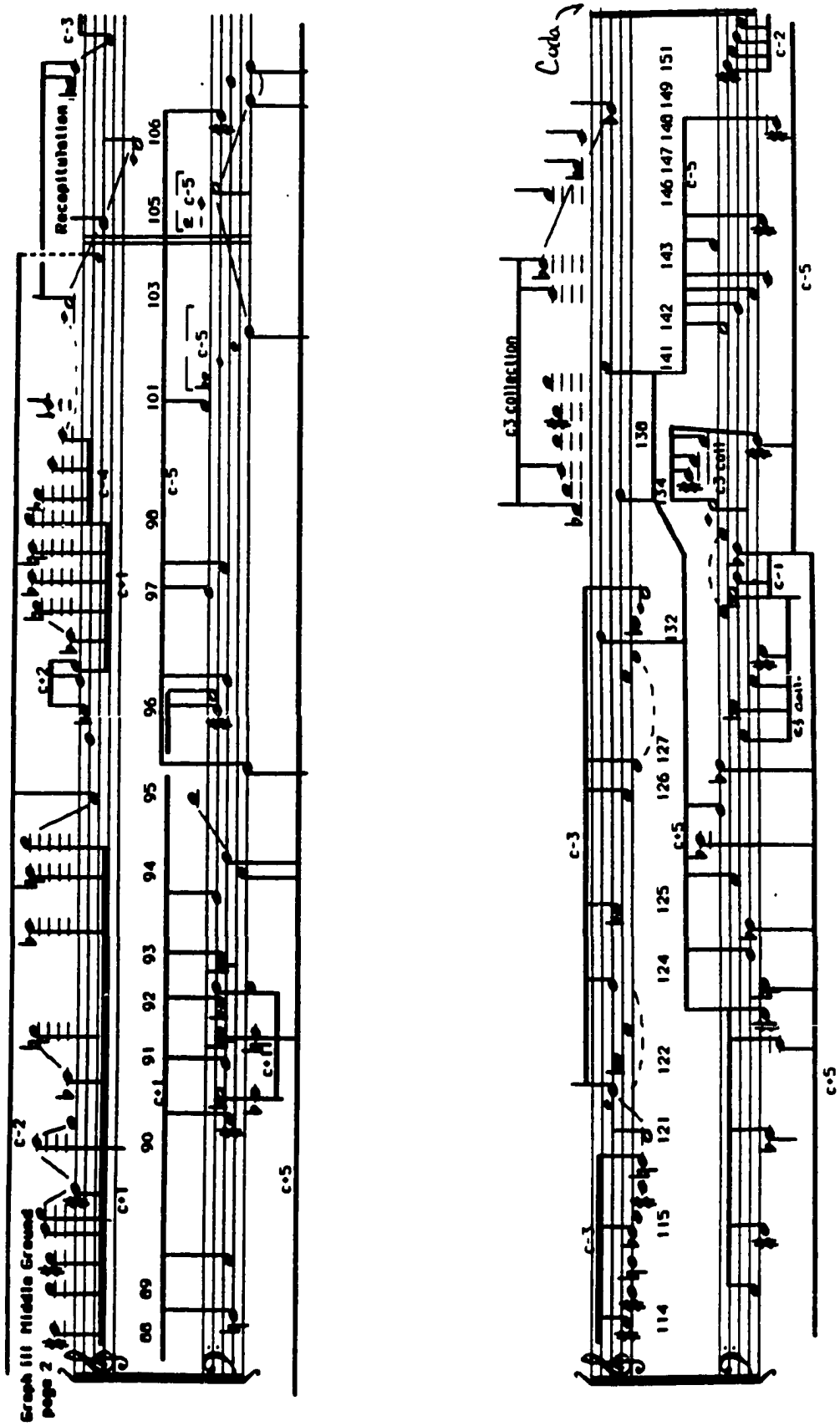
Ex 22a mm. 72-73

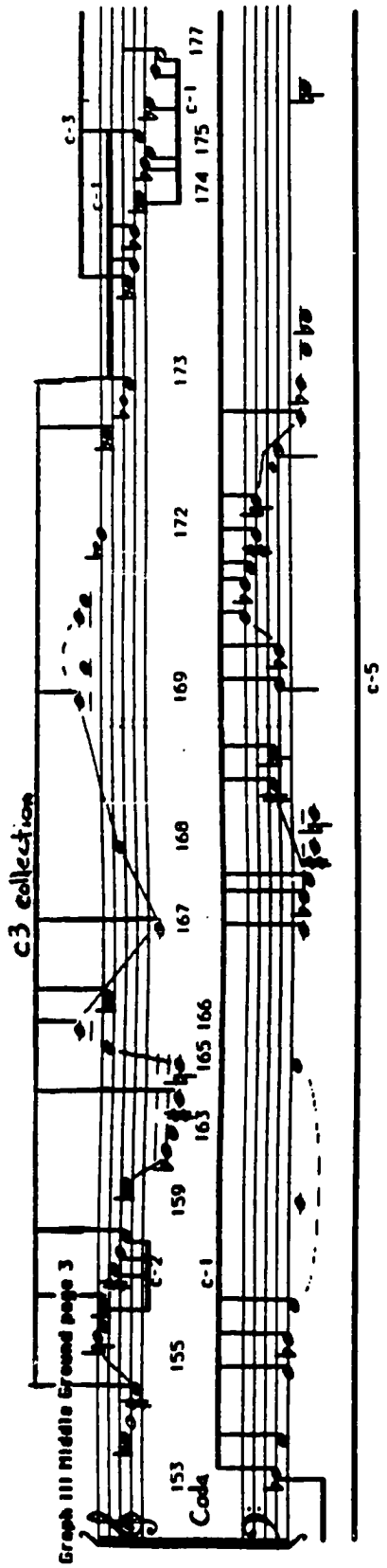


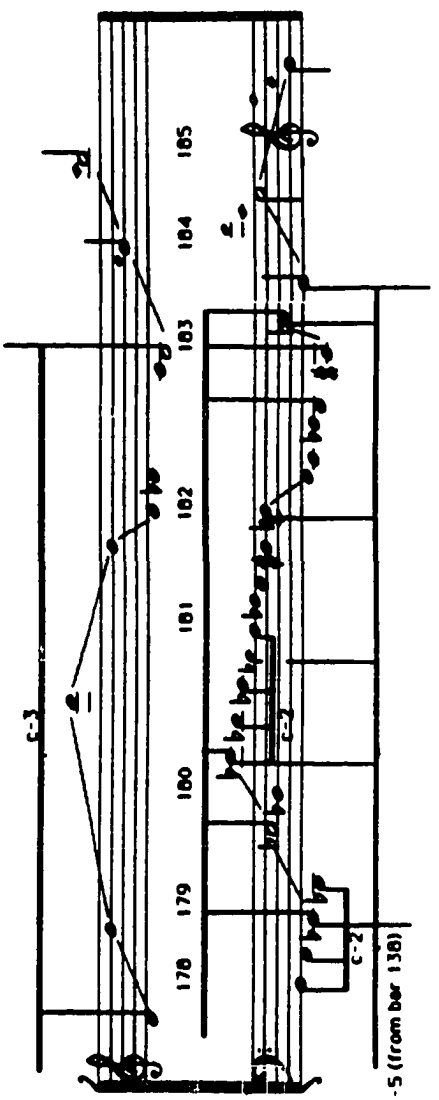


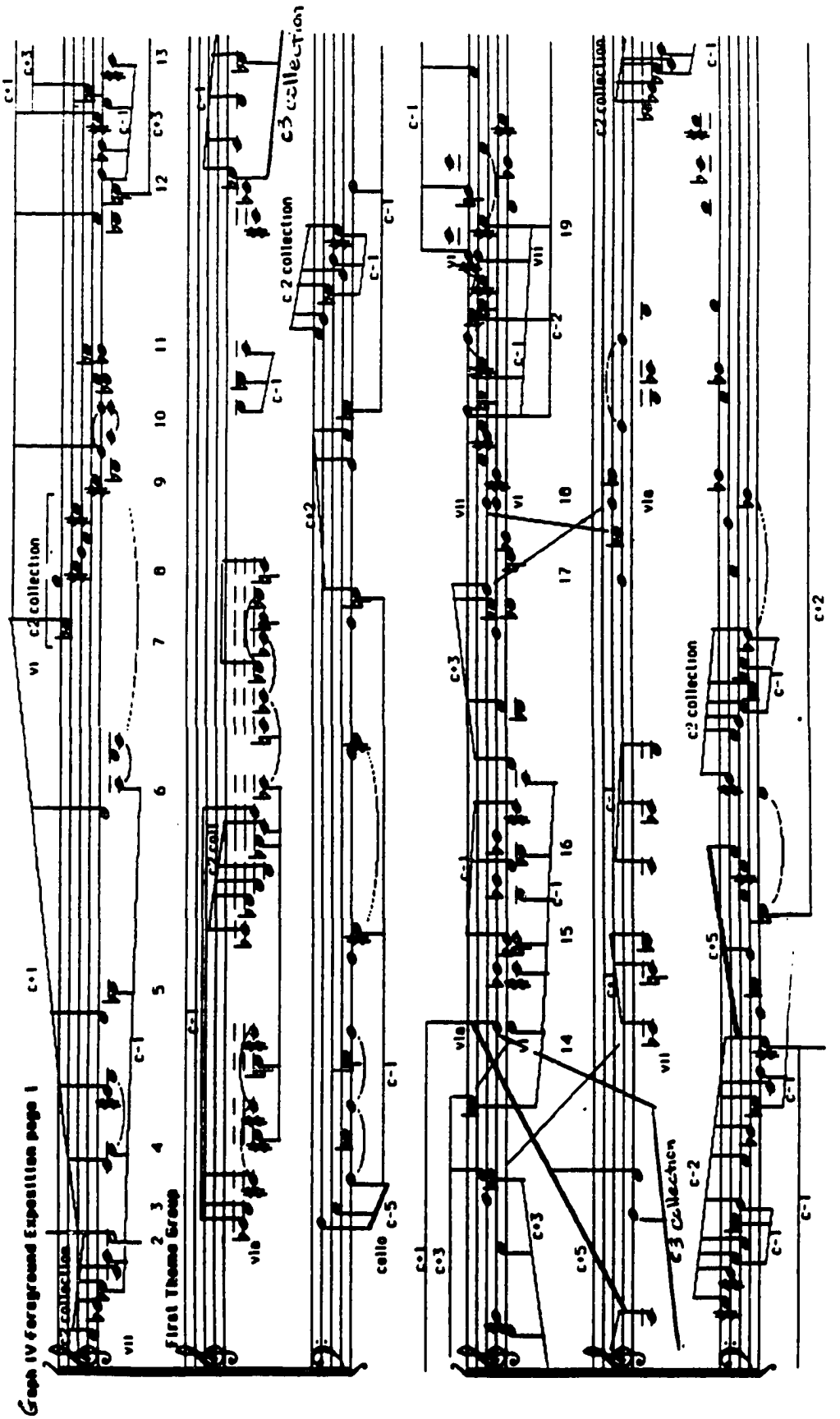


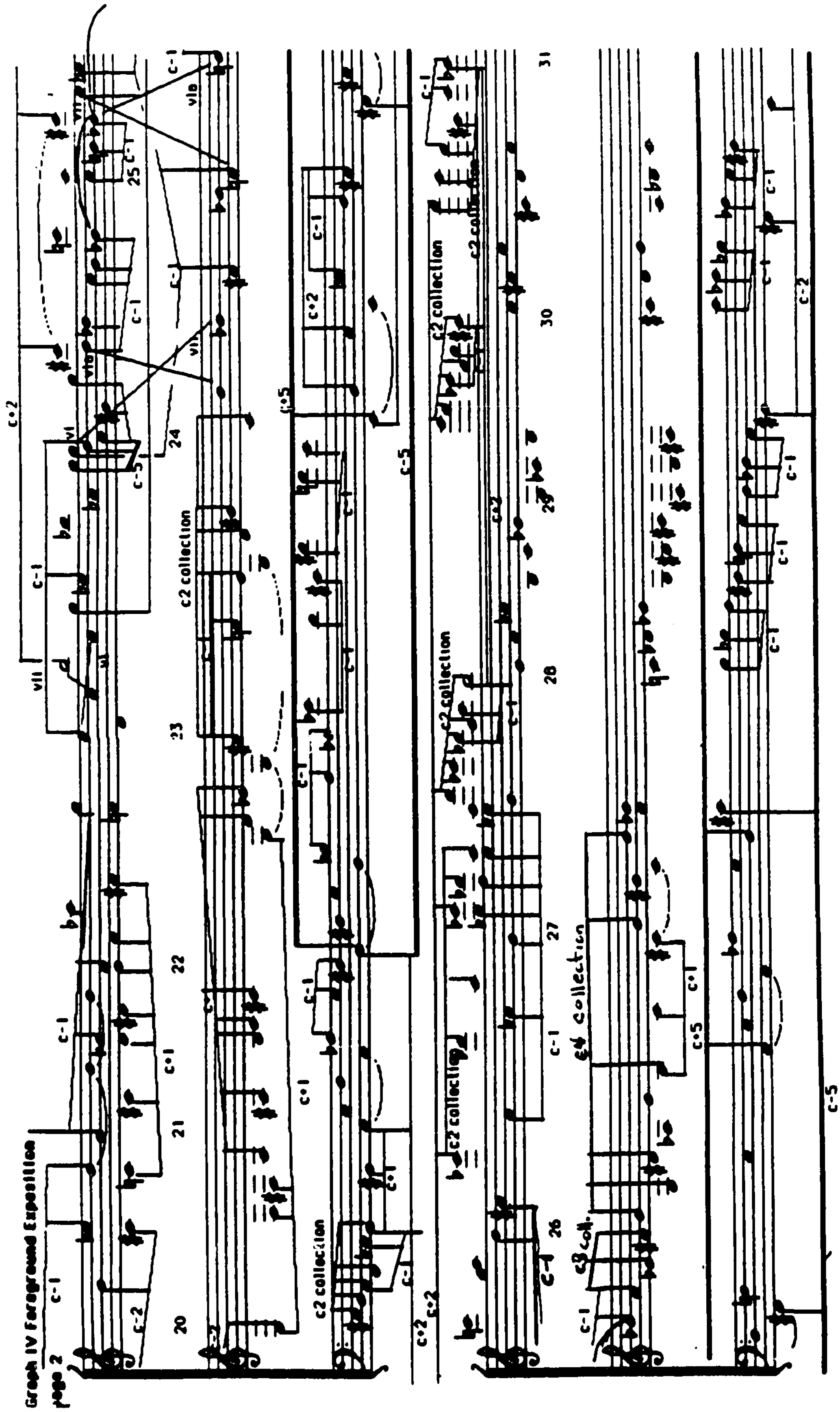


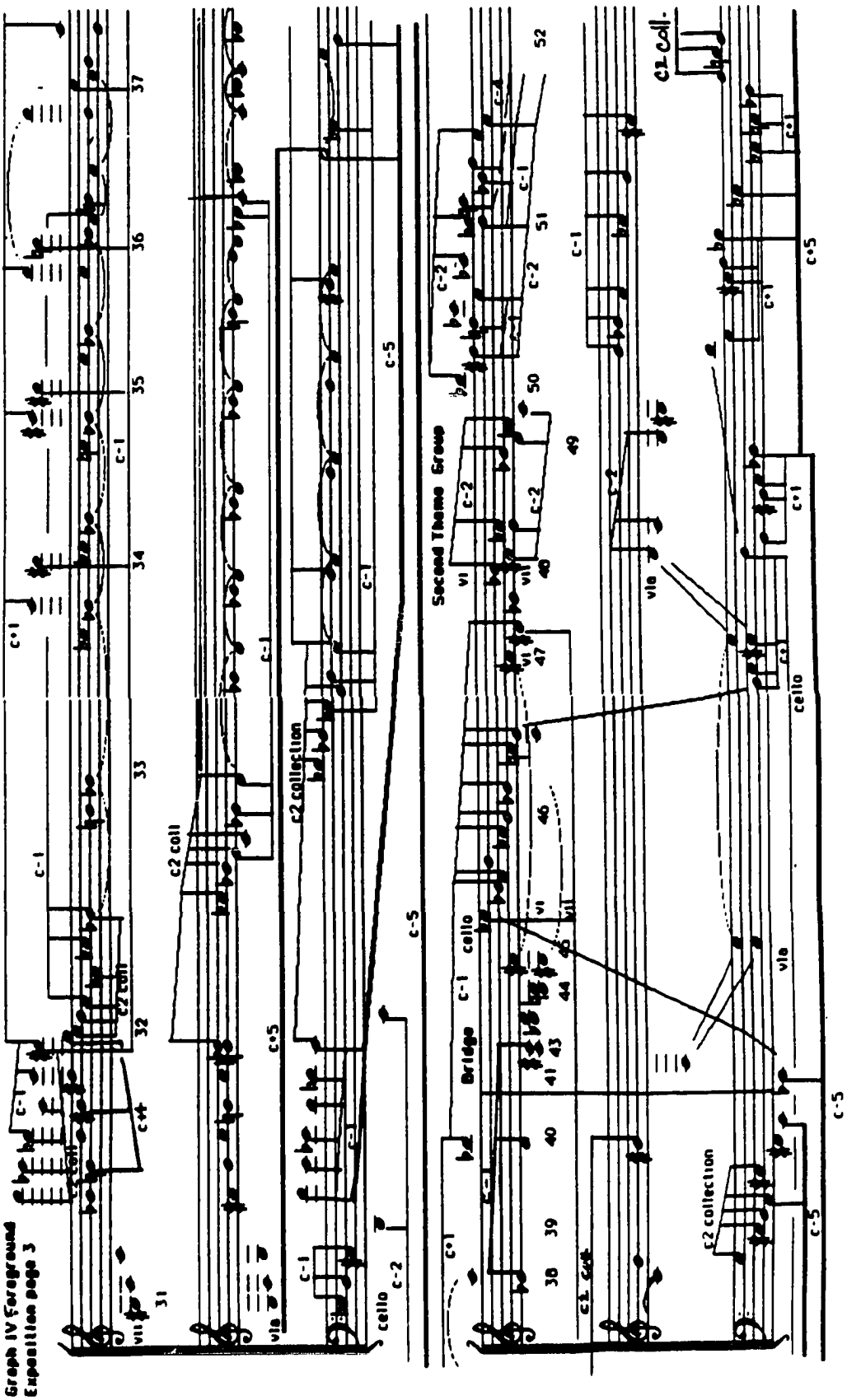


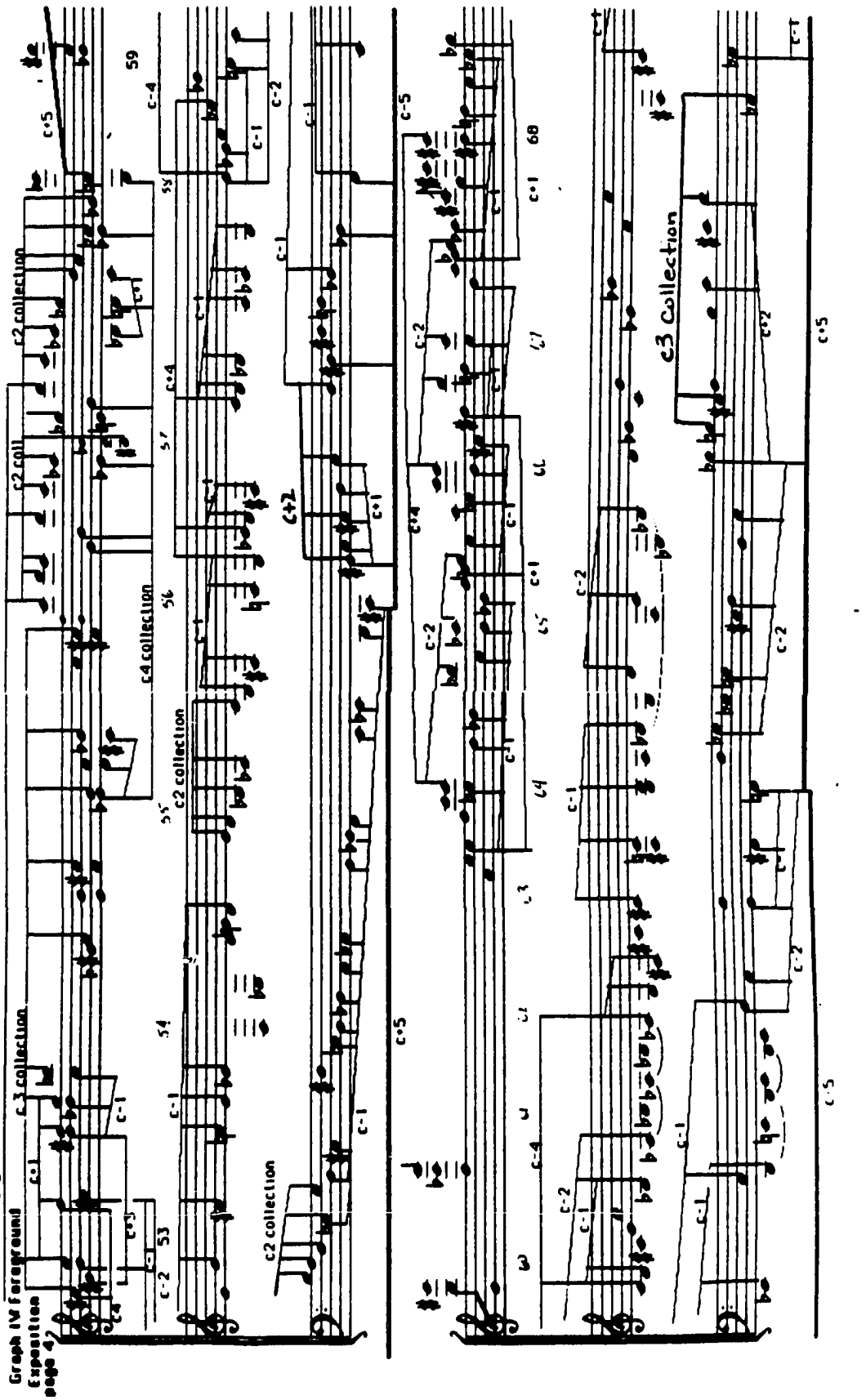


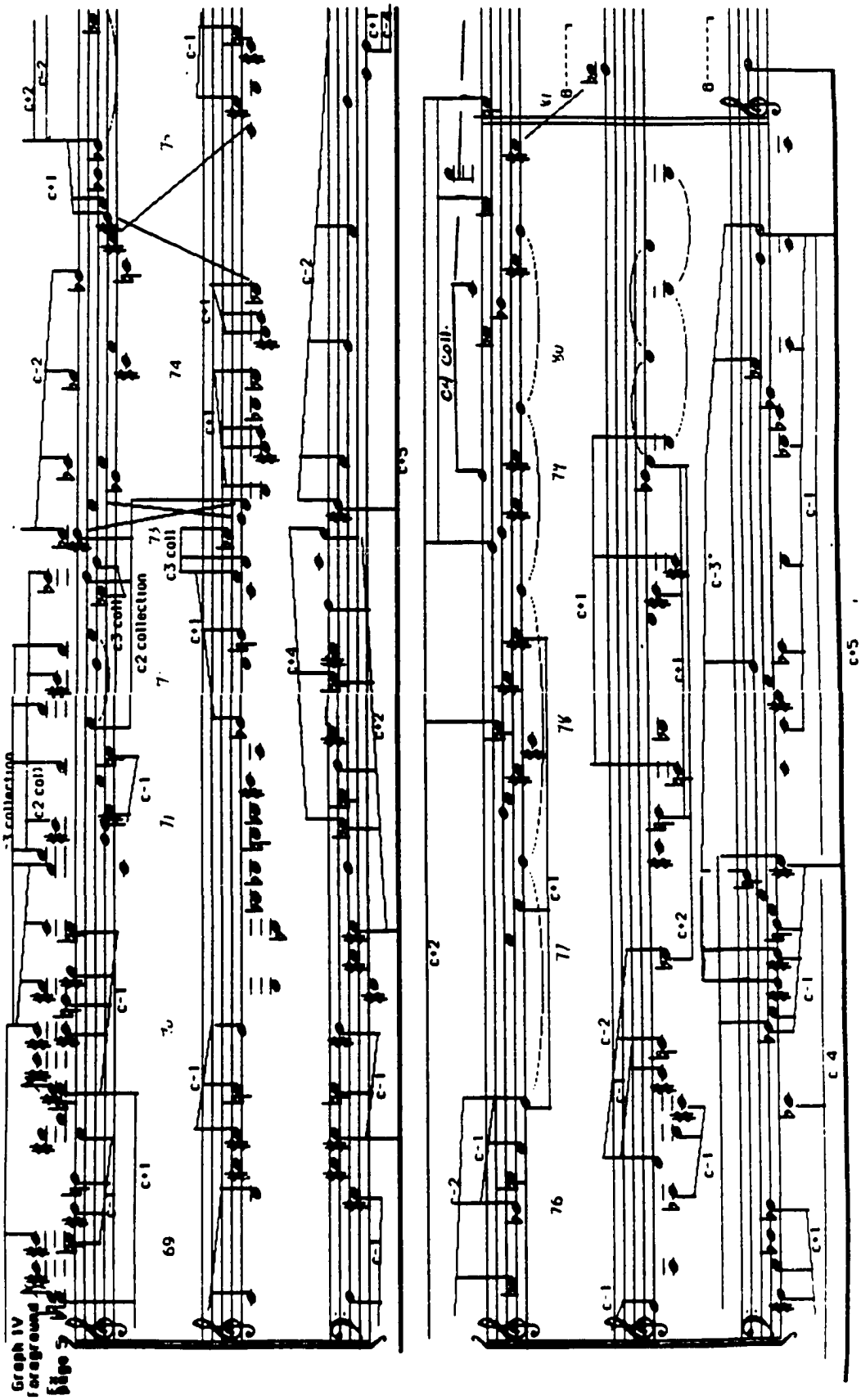


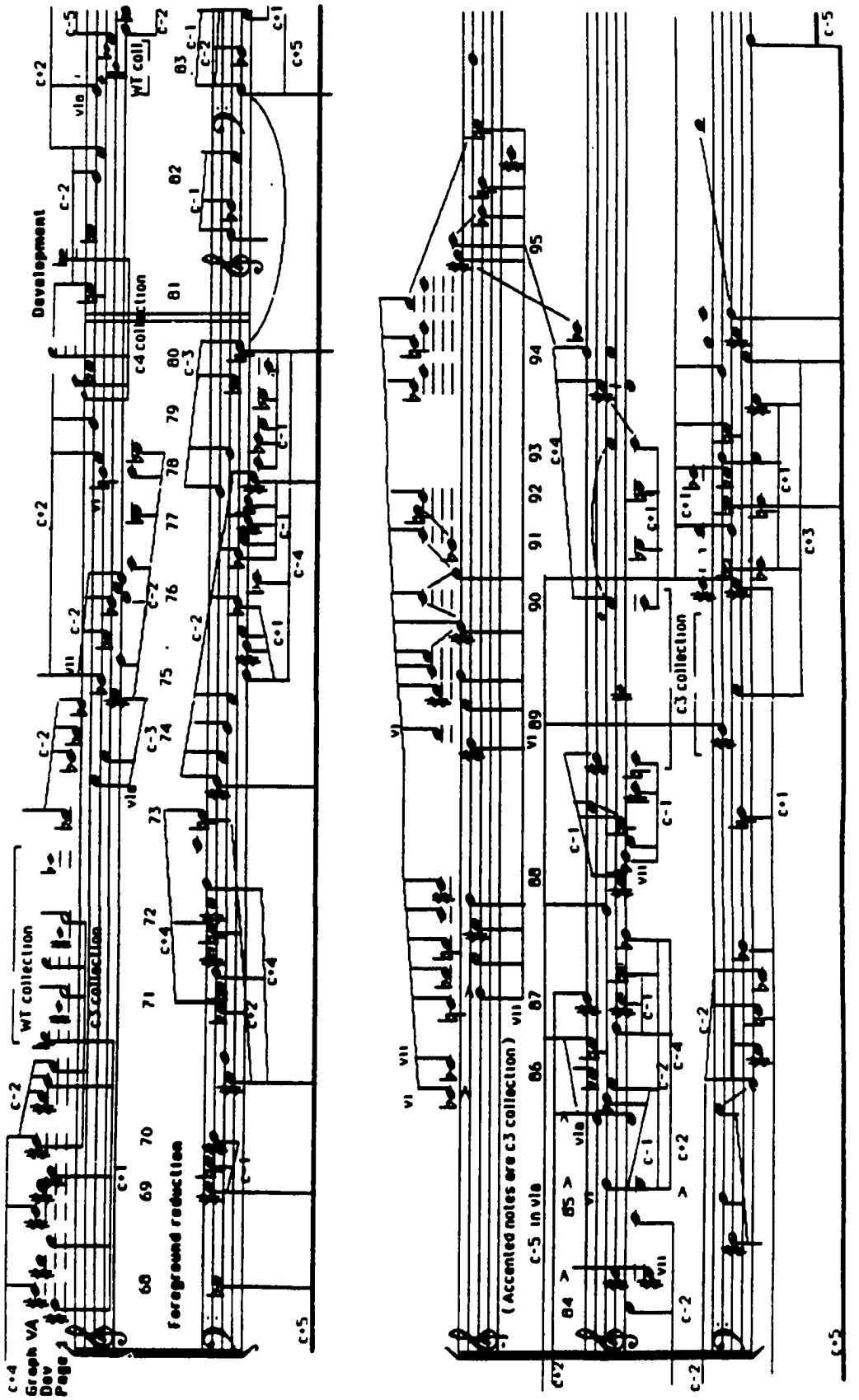


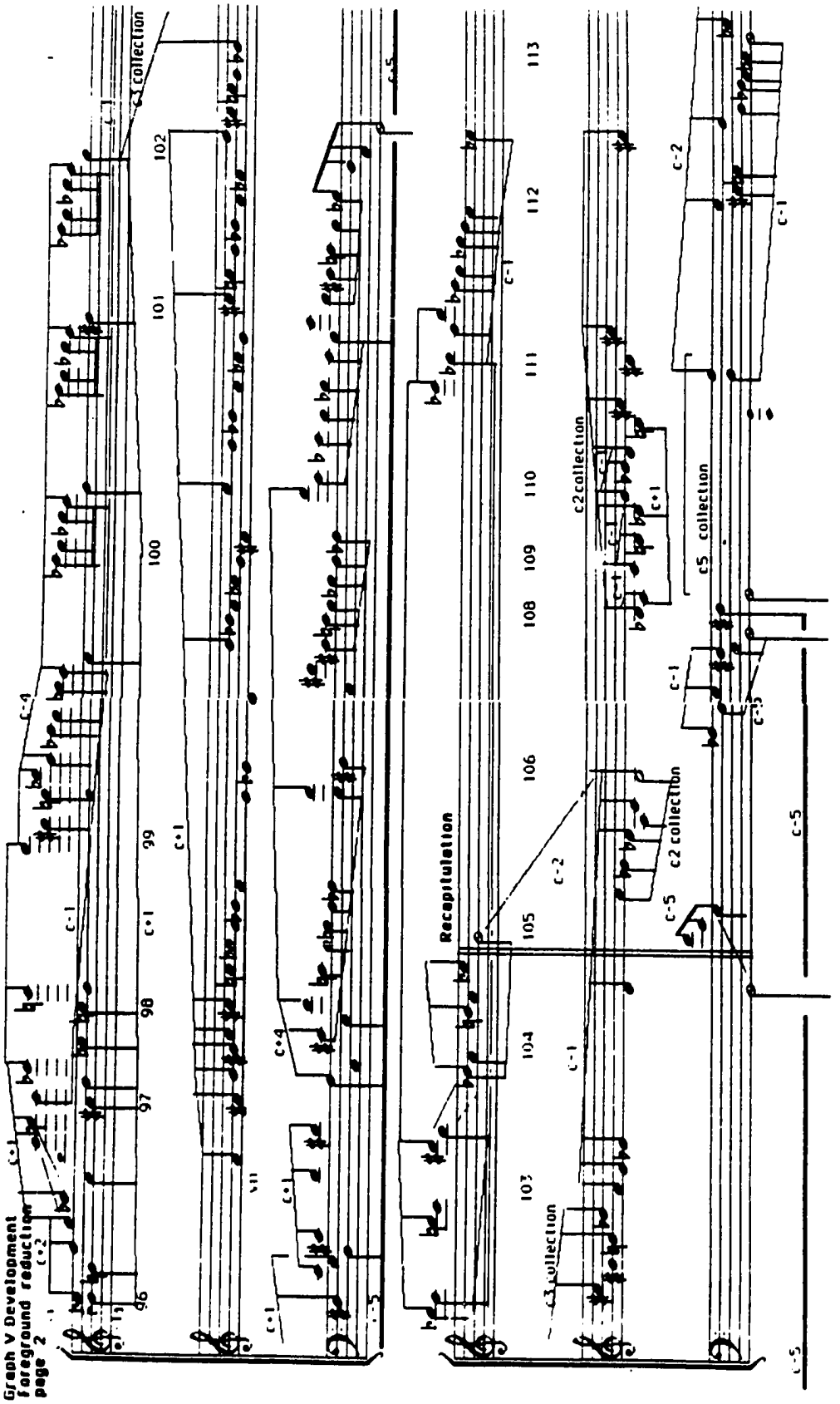


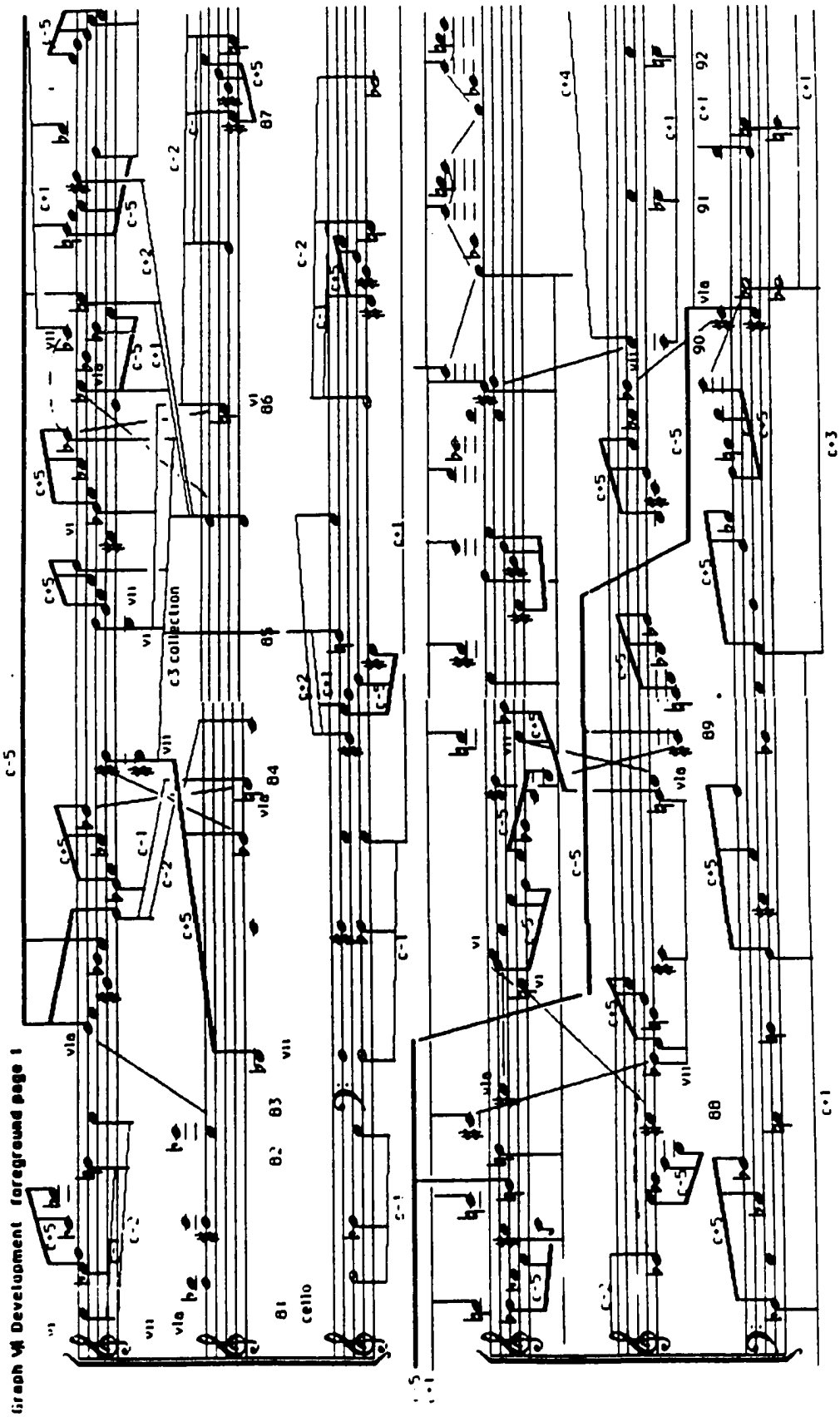


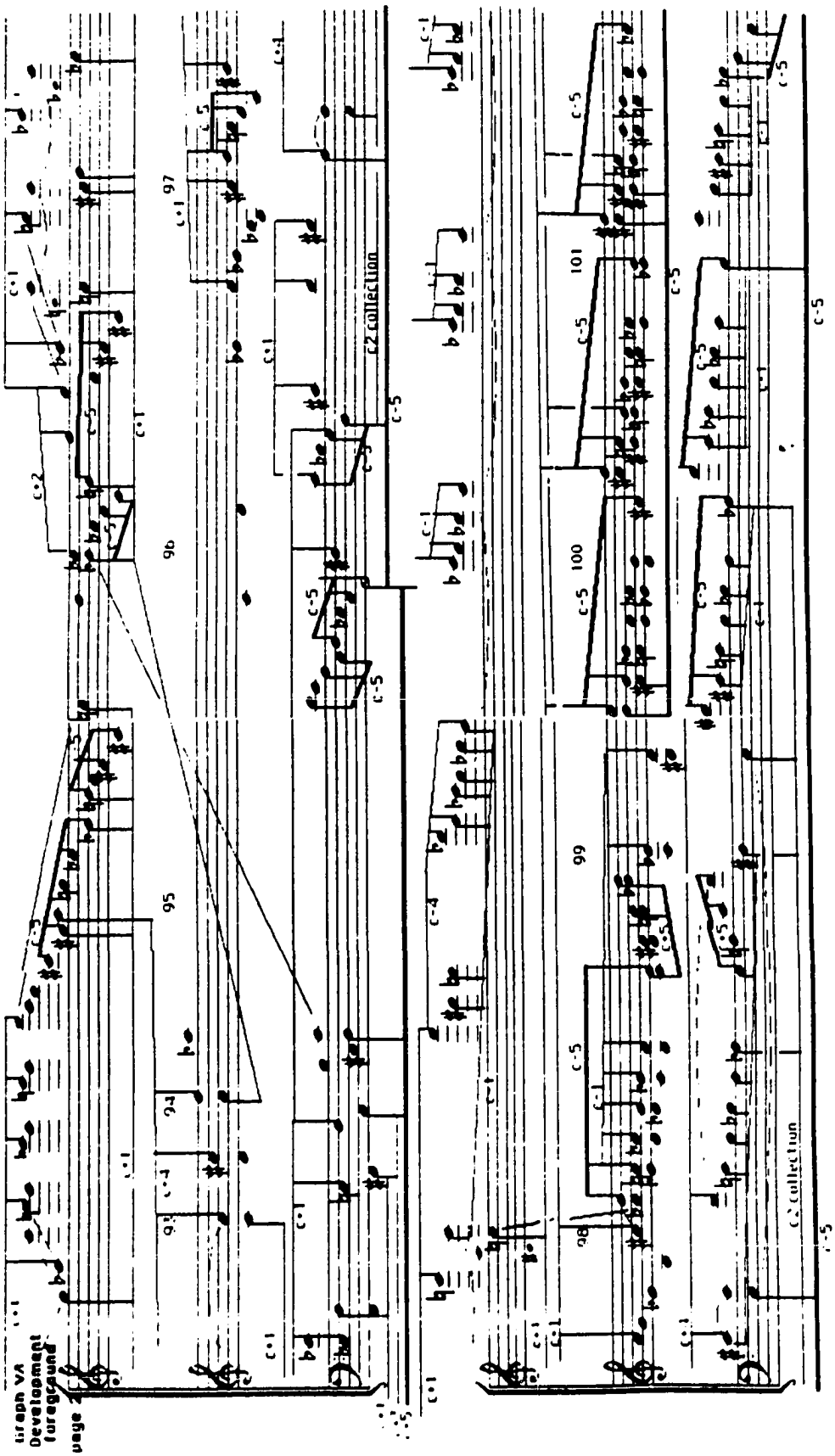


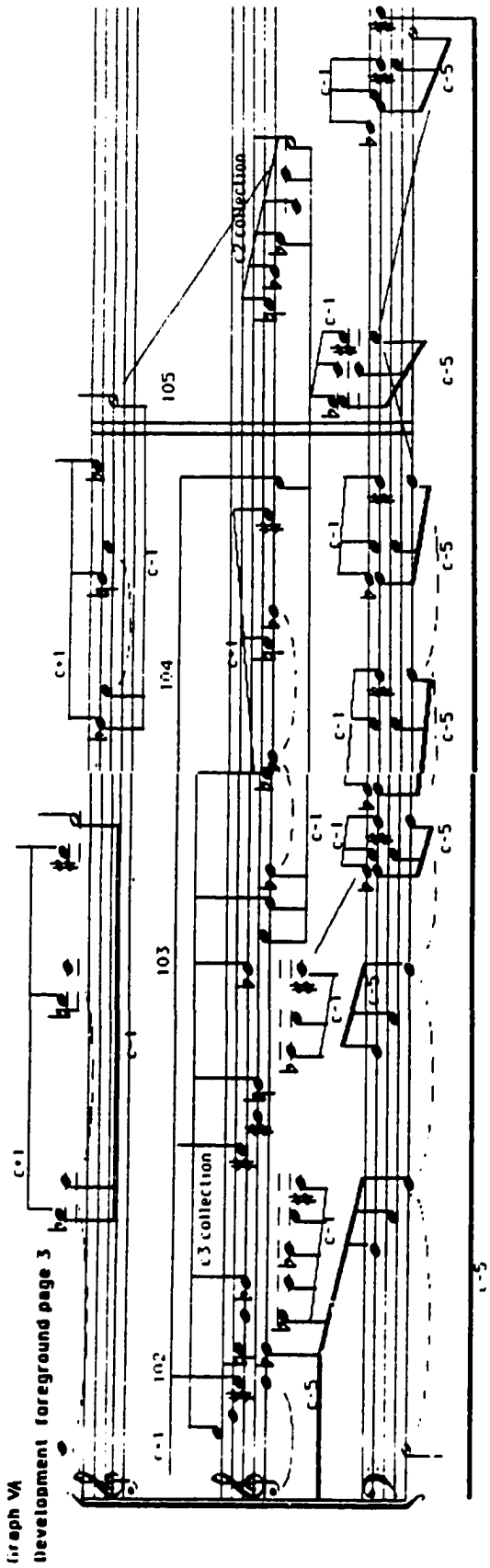




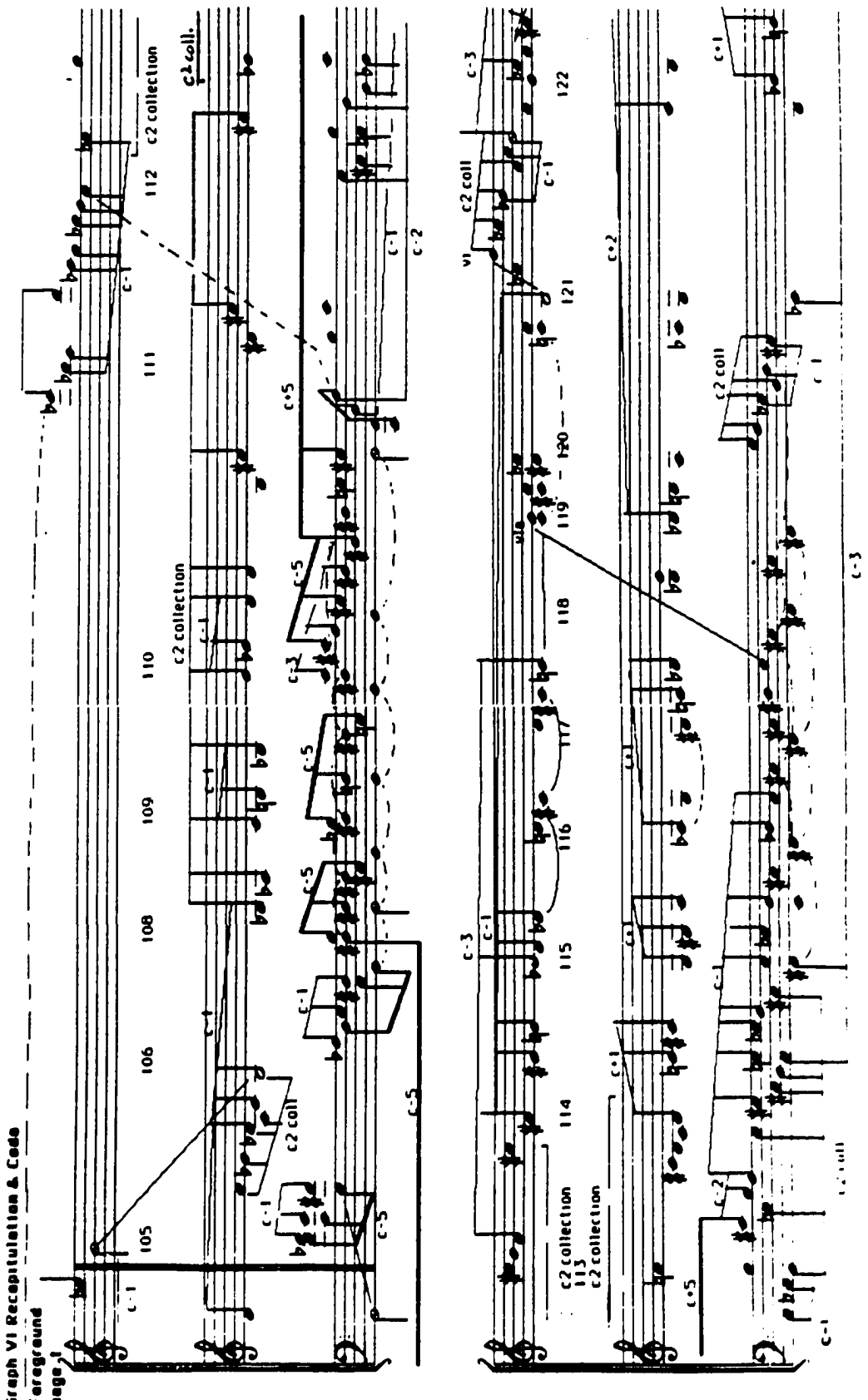


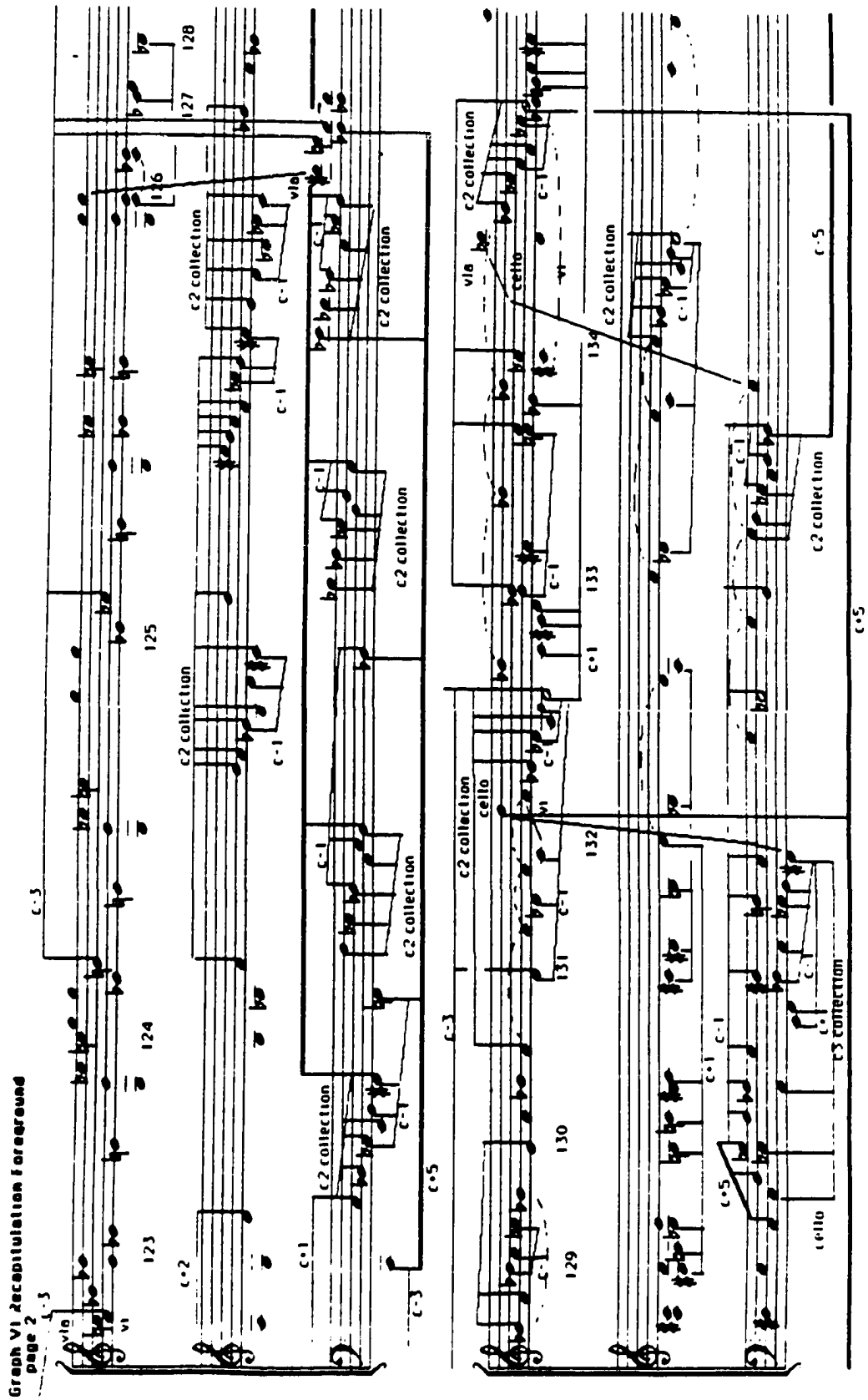


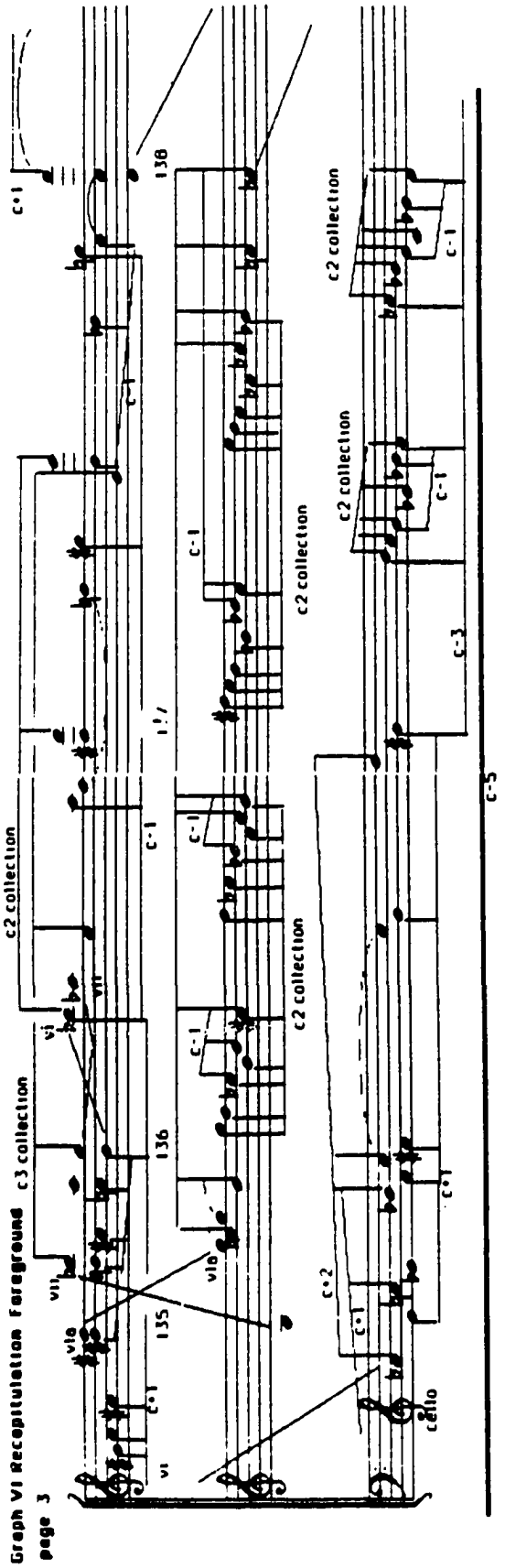


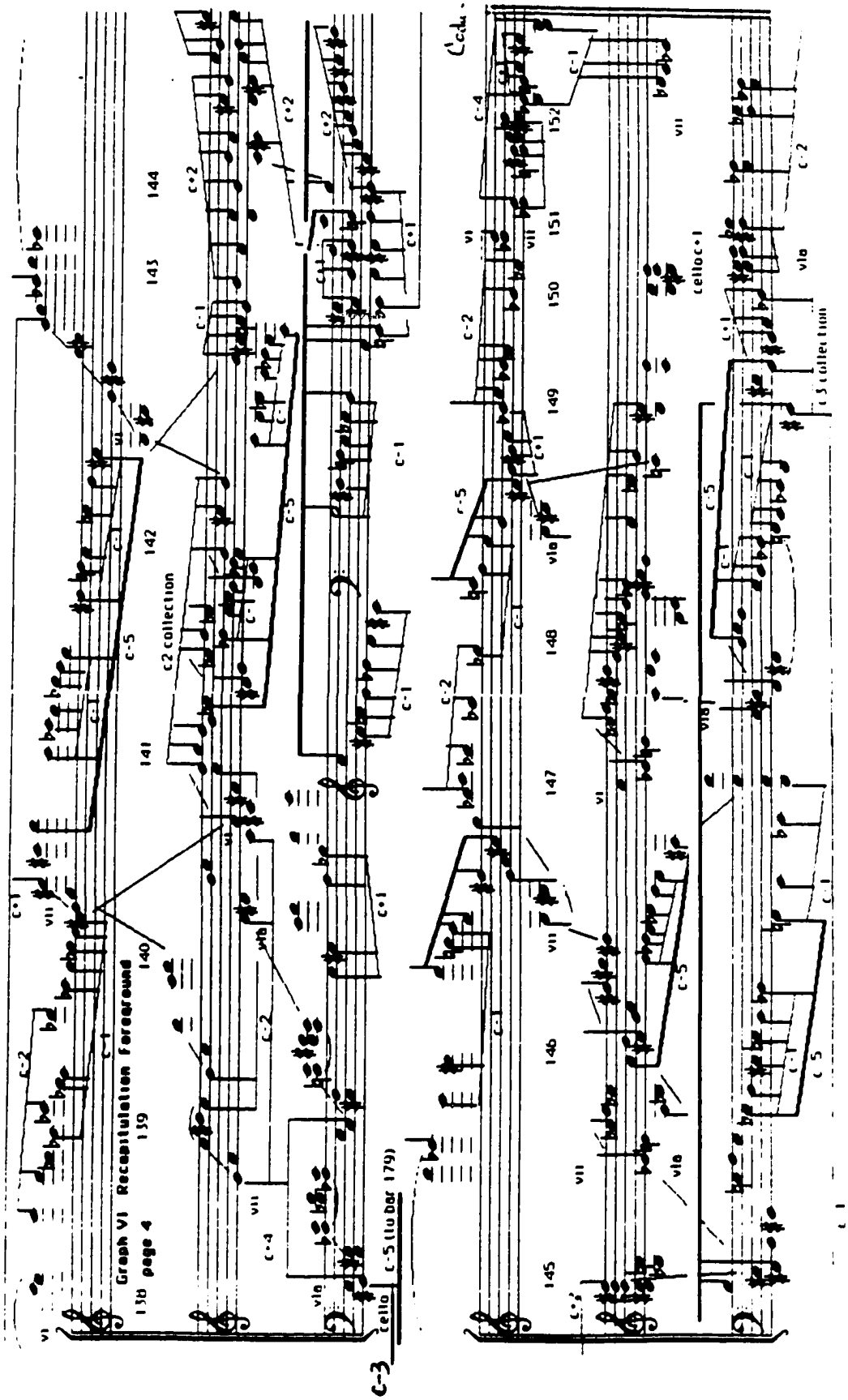


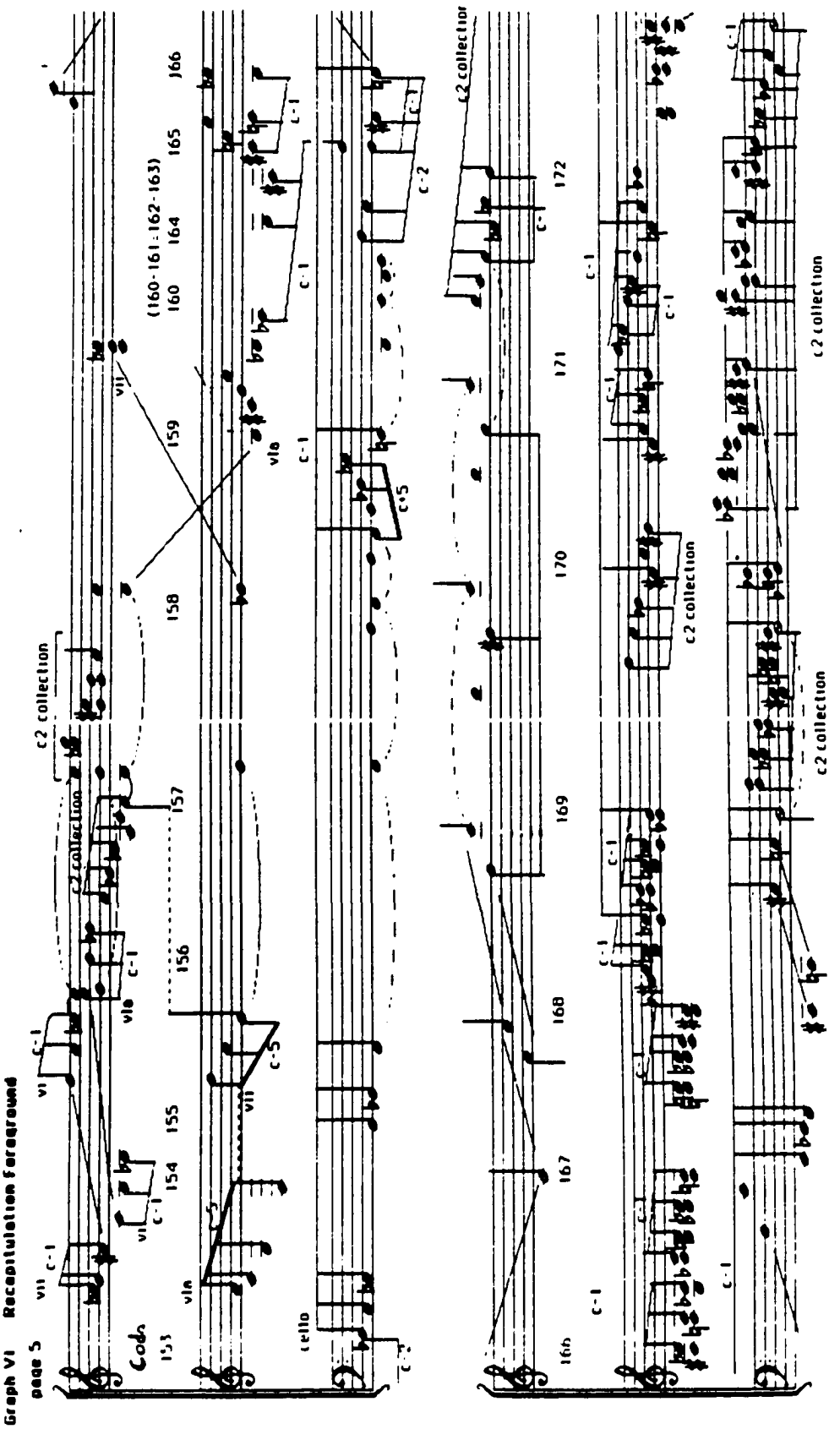
Graph VA
Development foreground page 3

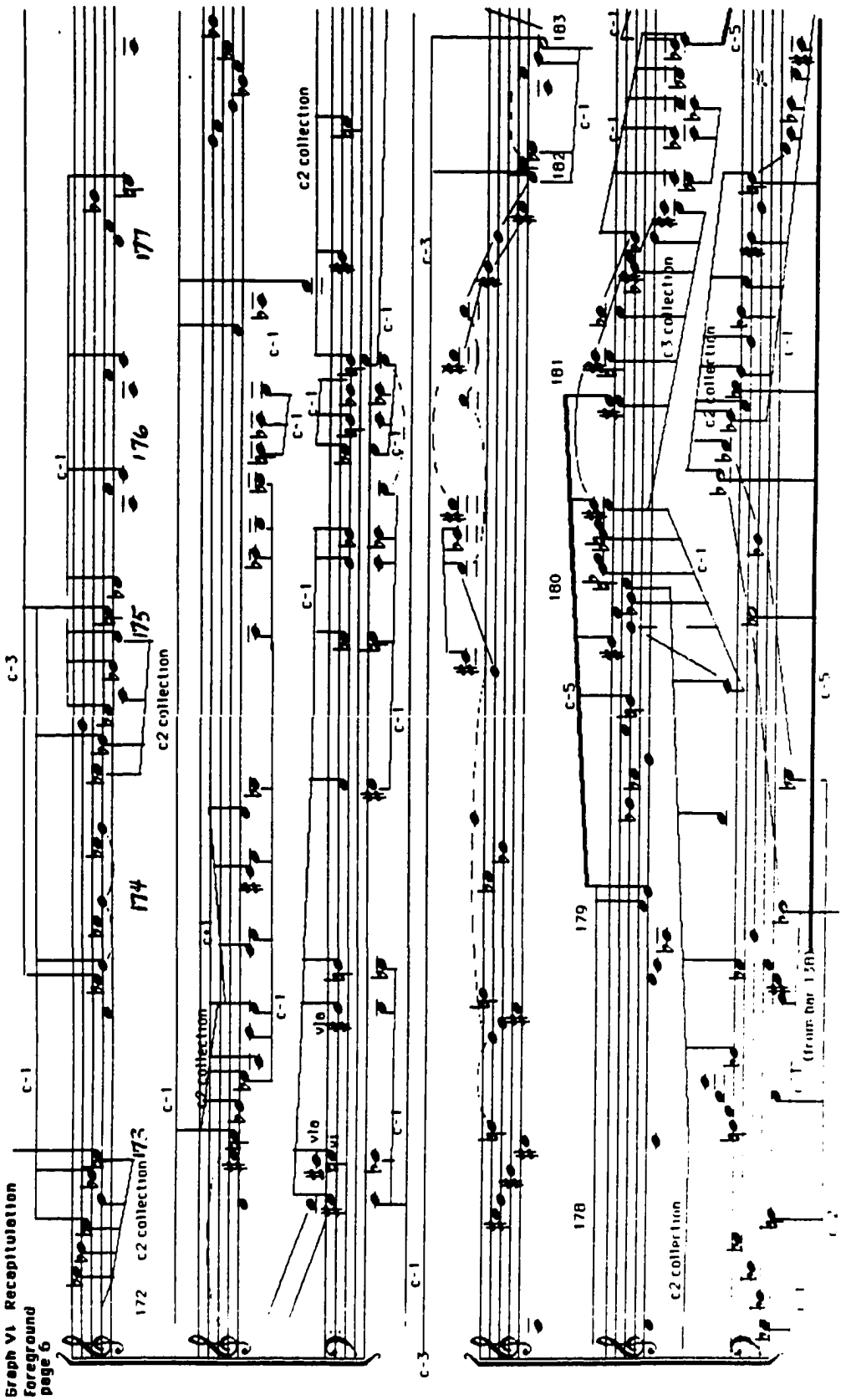


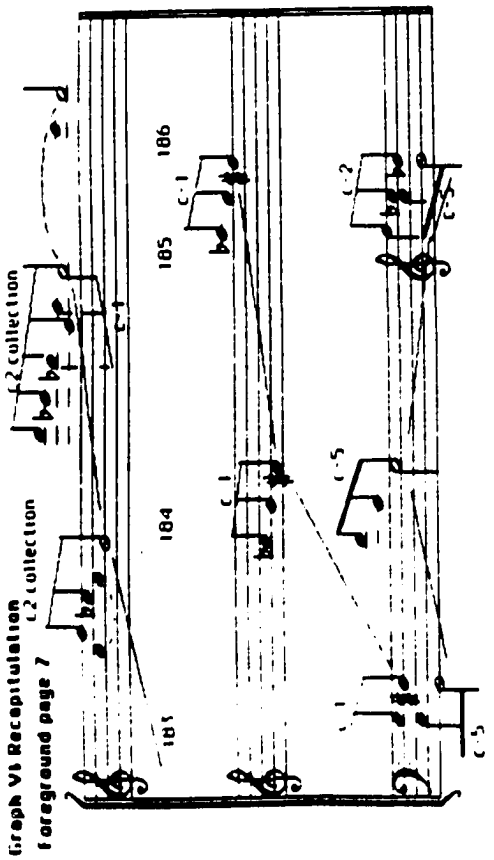


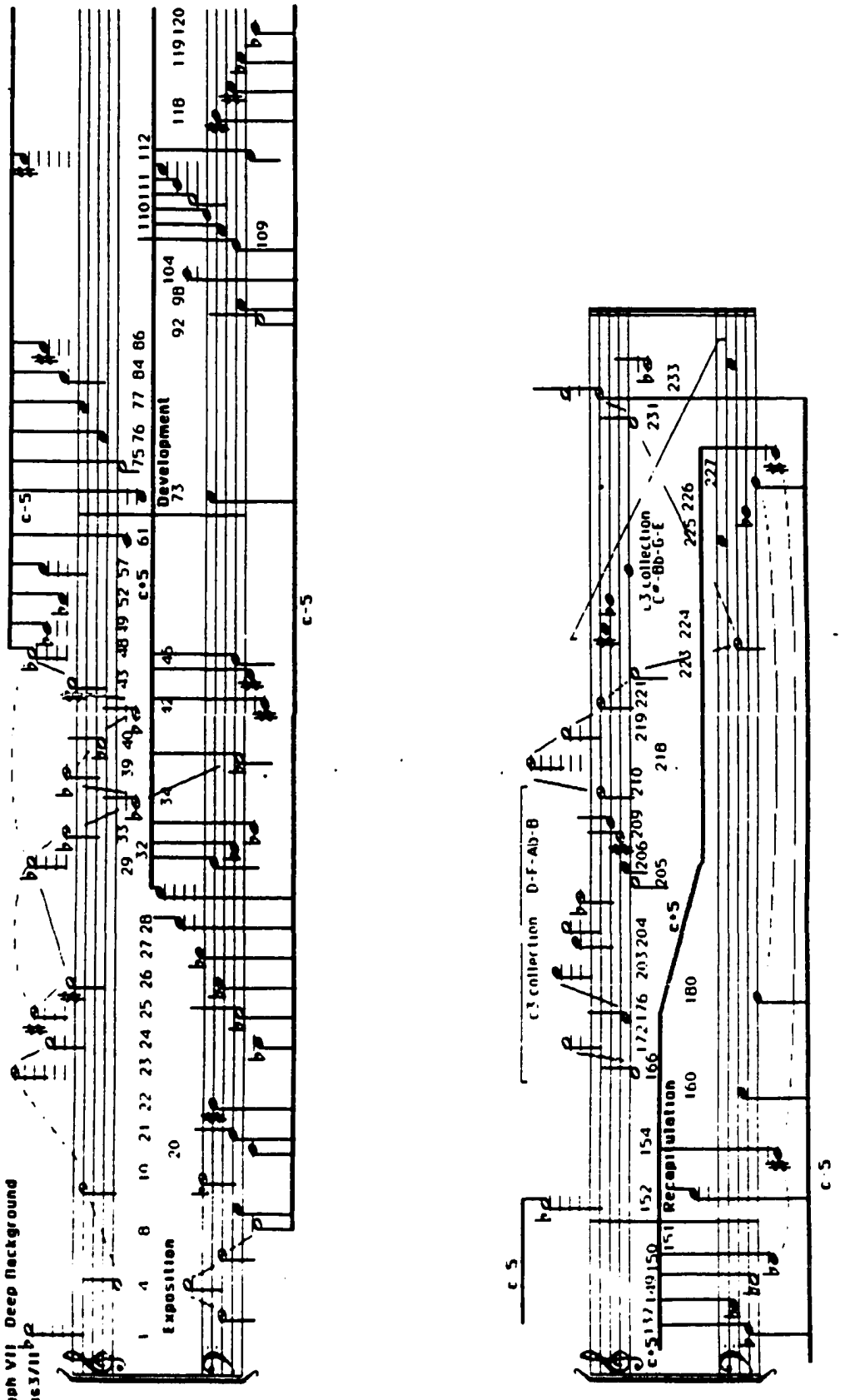


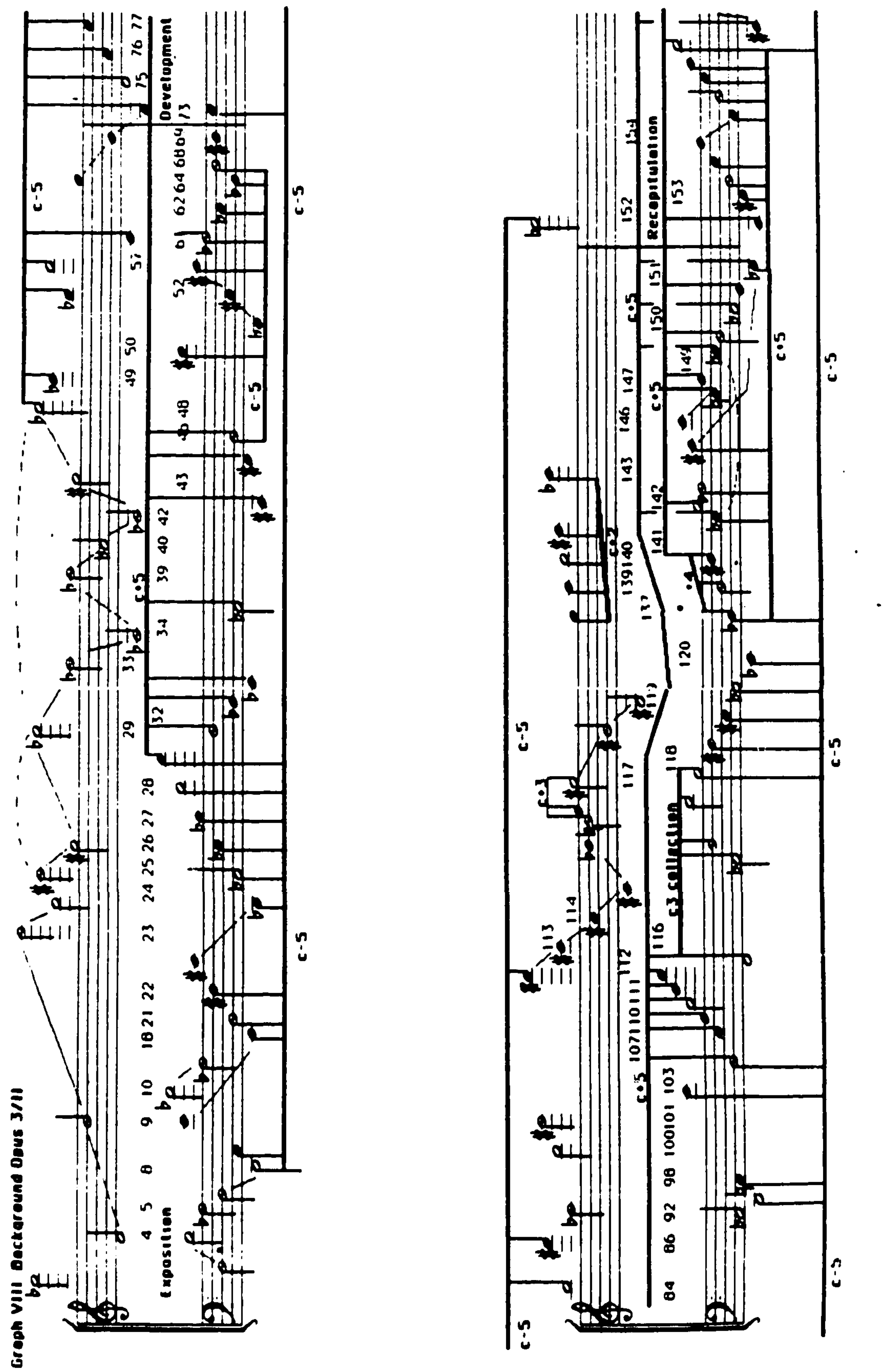


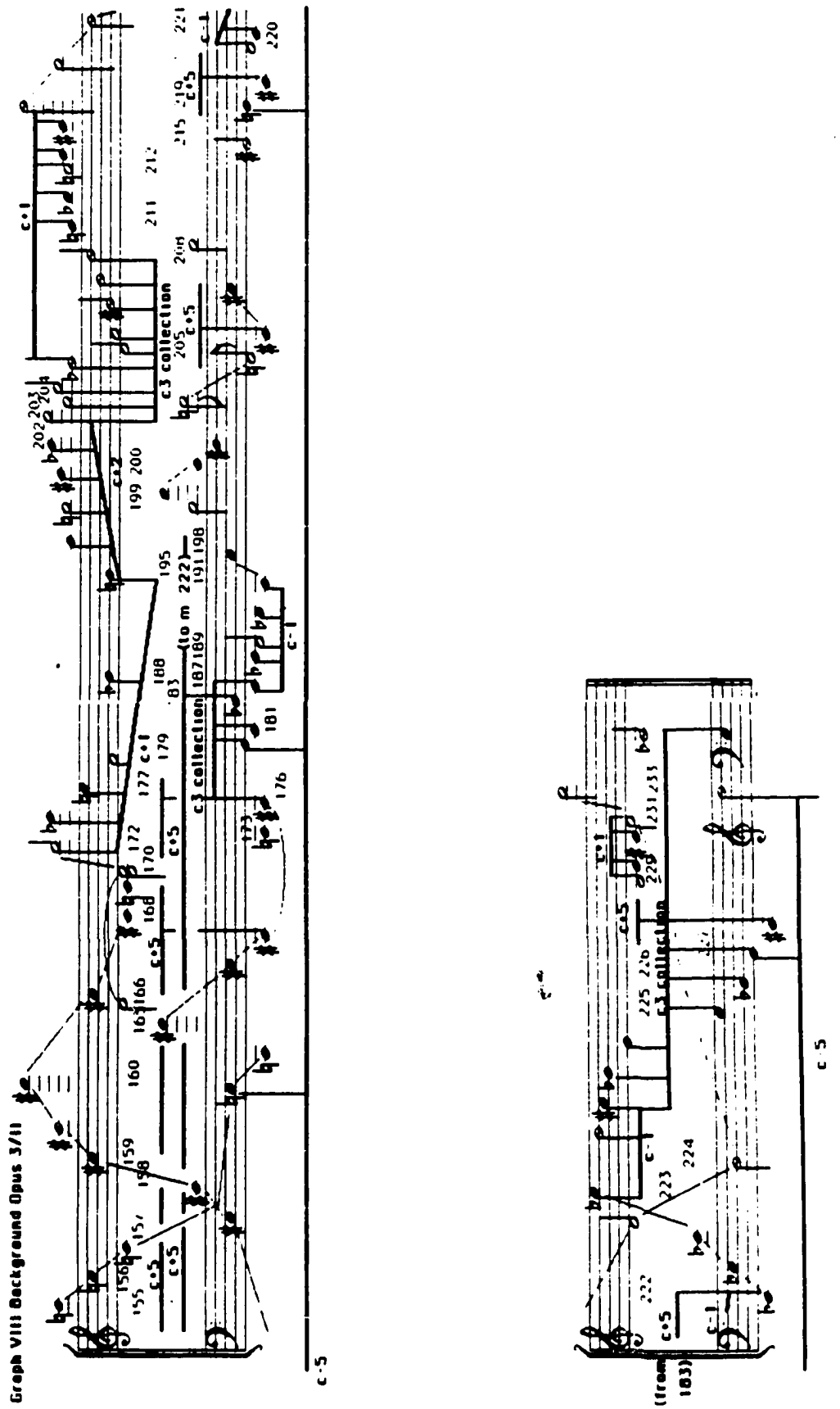


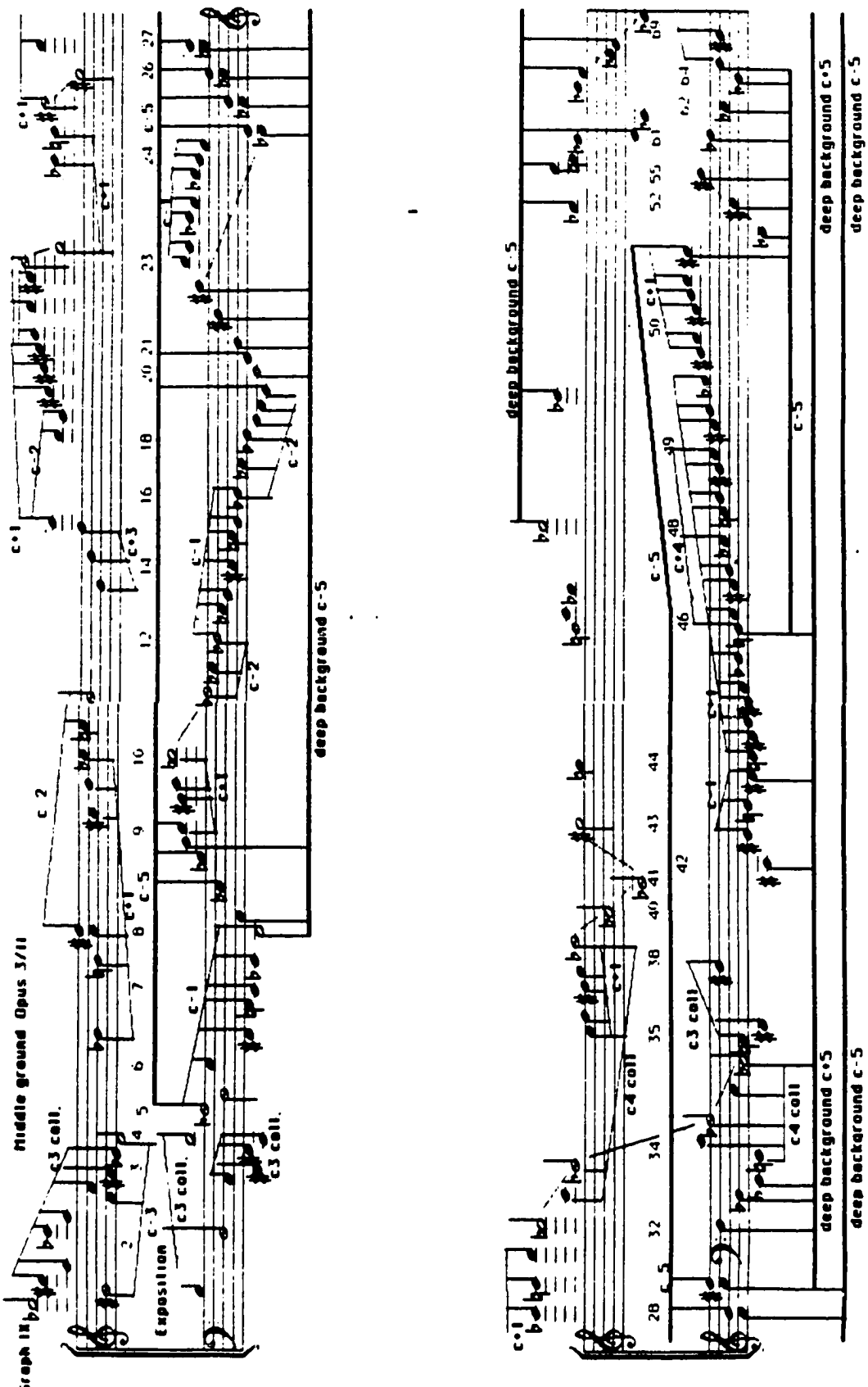


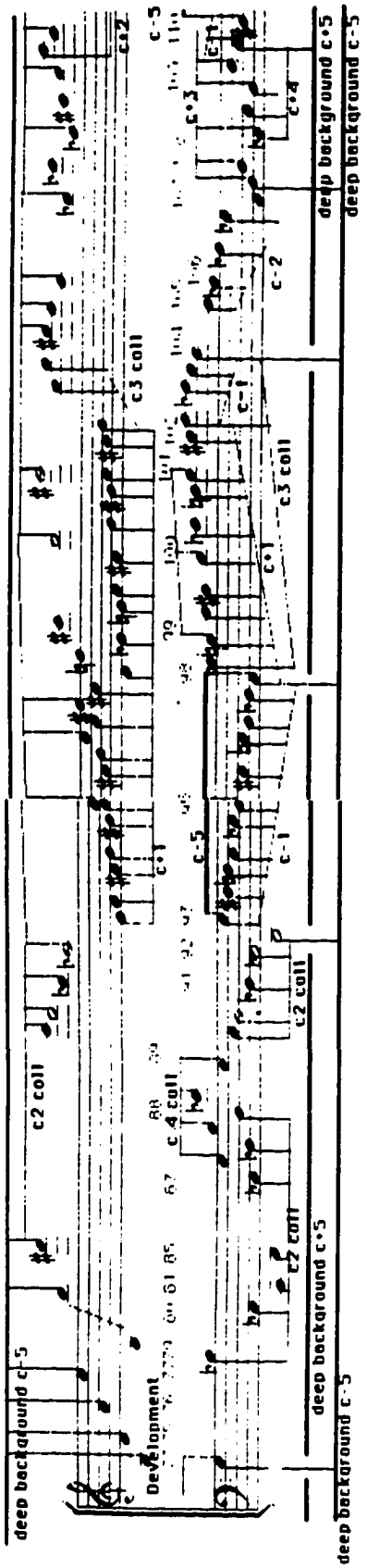


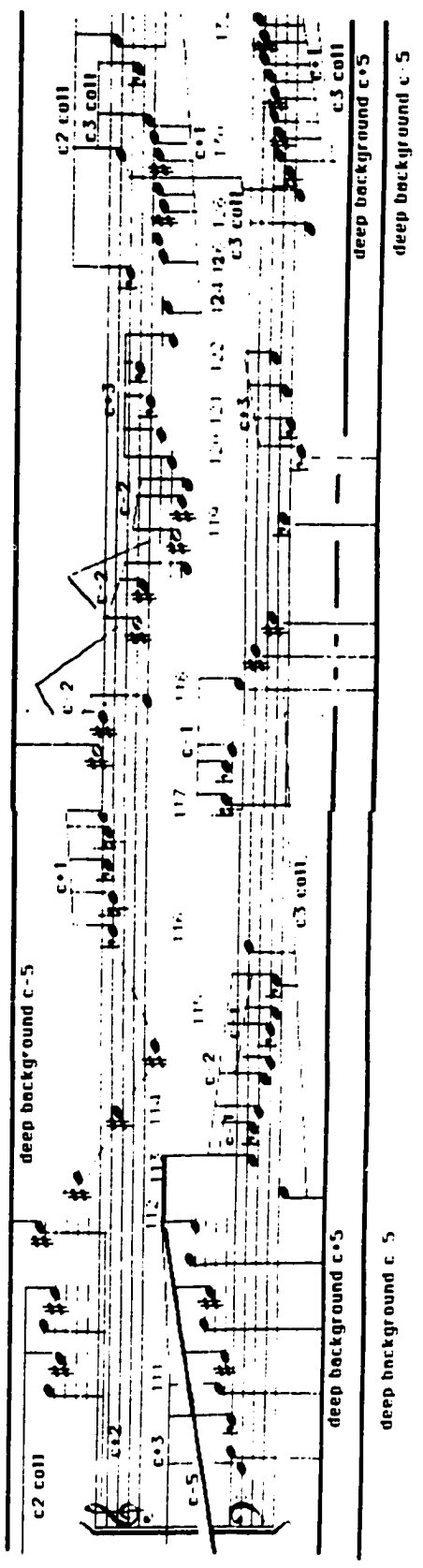


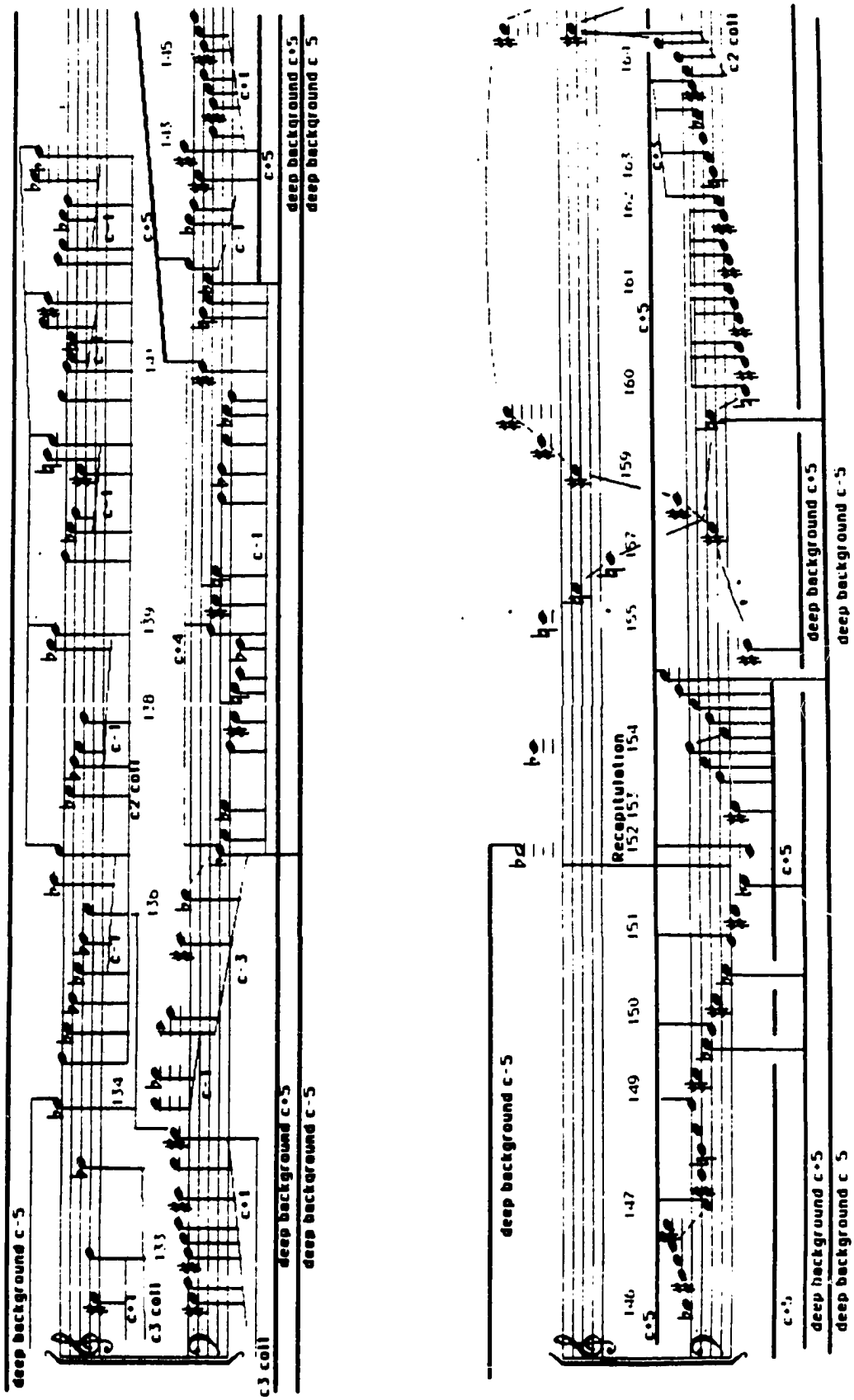


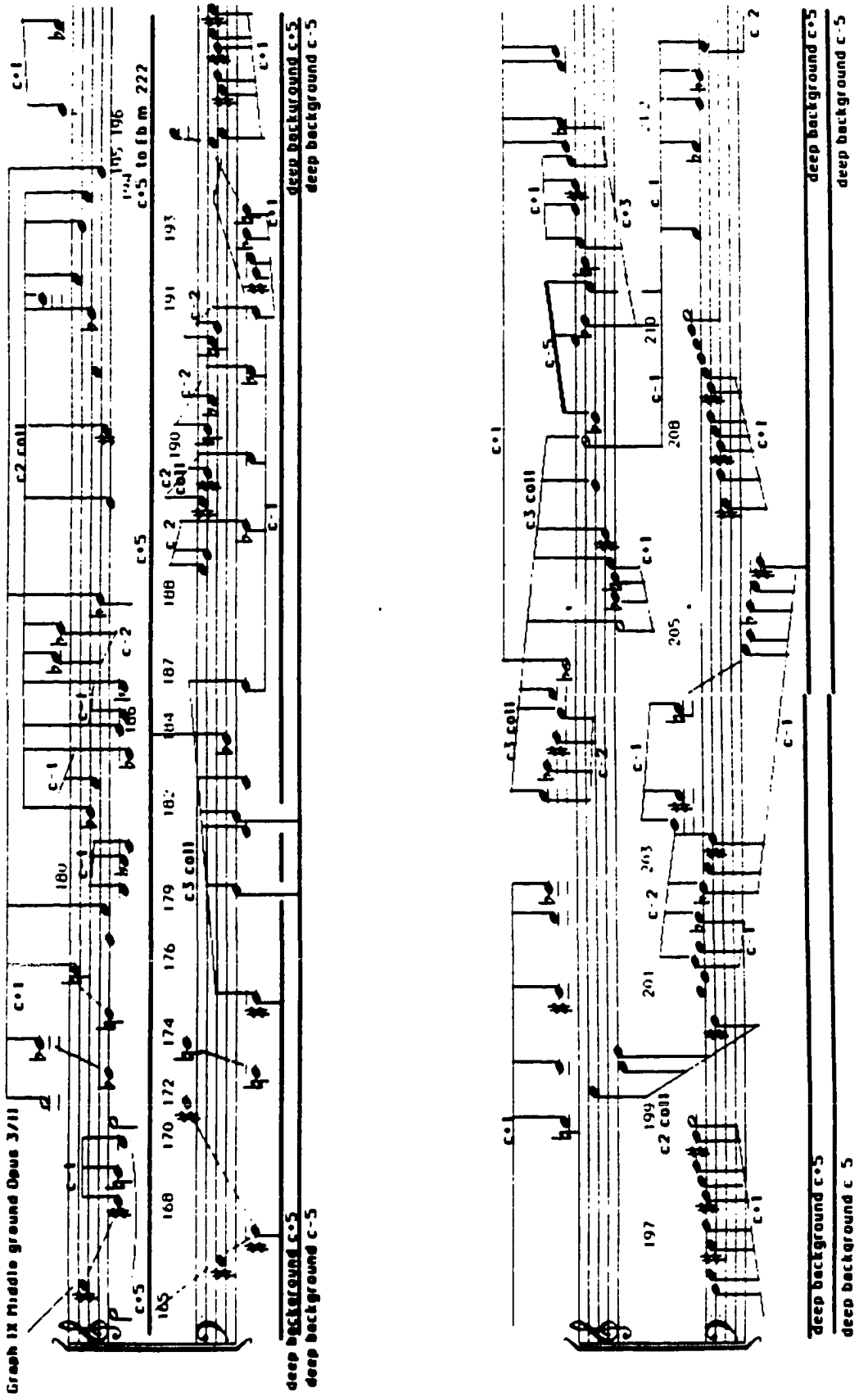


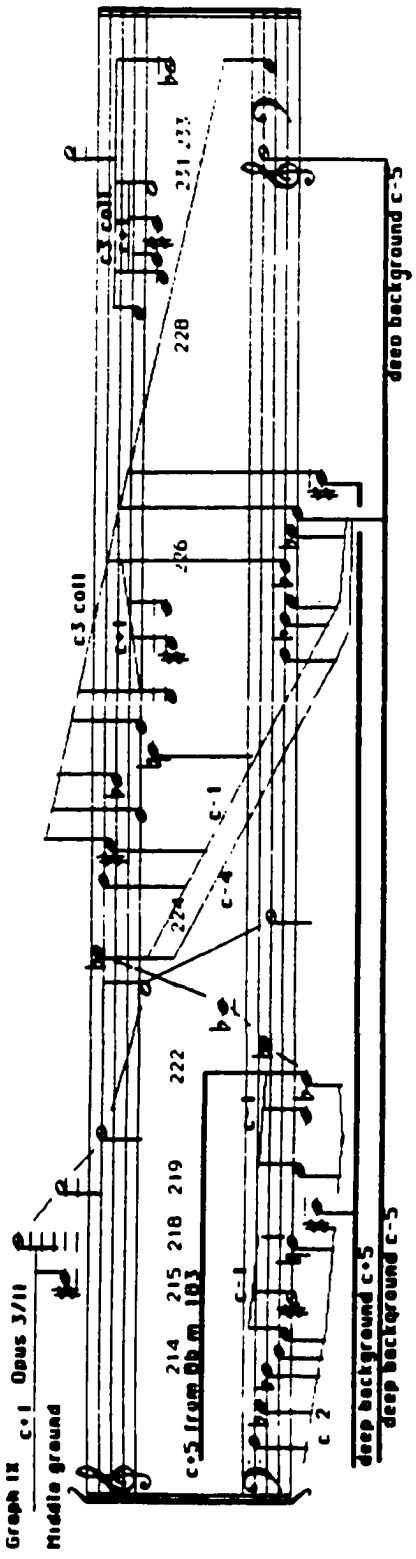




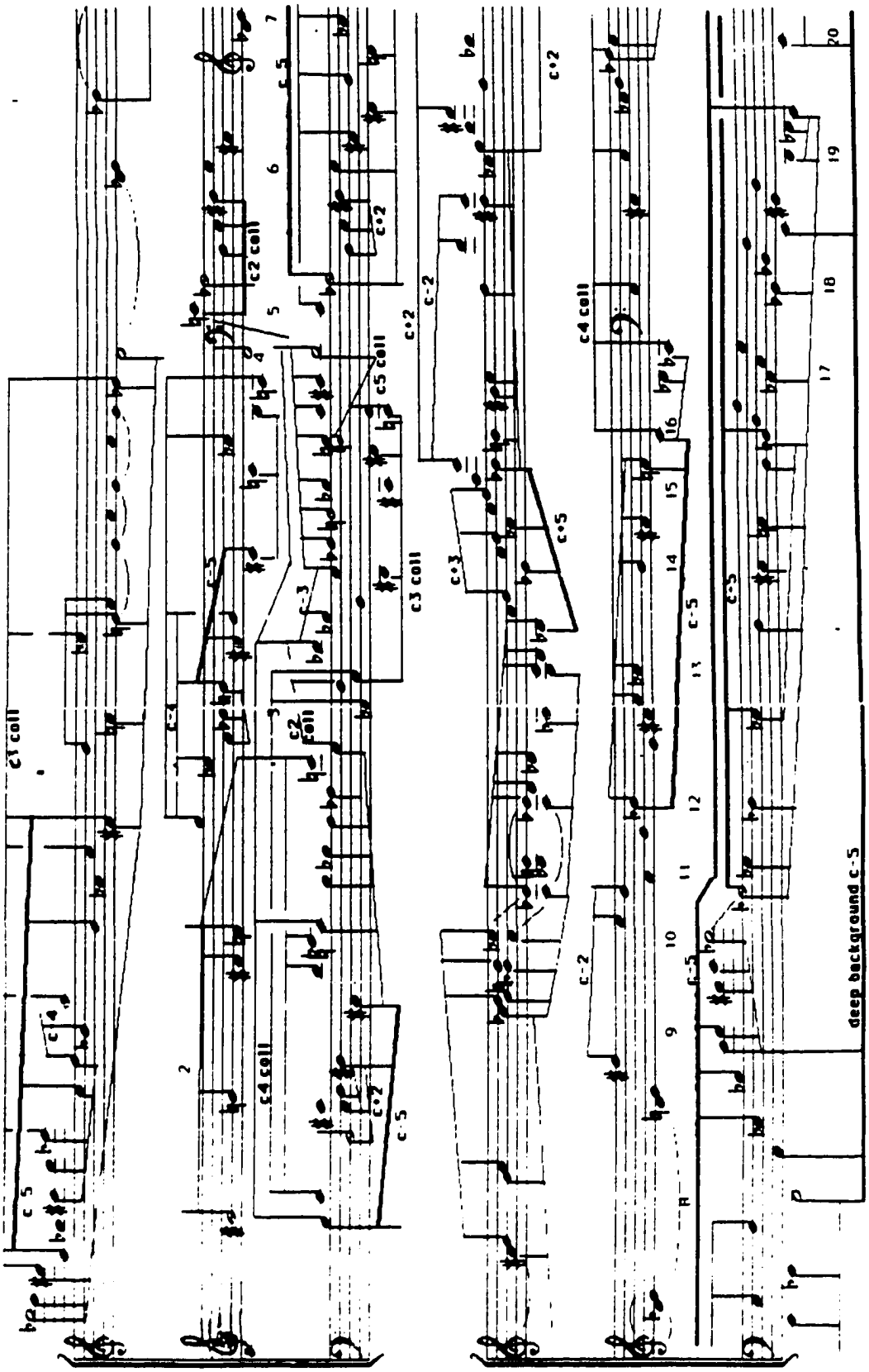


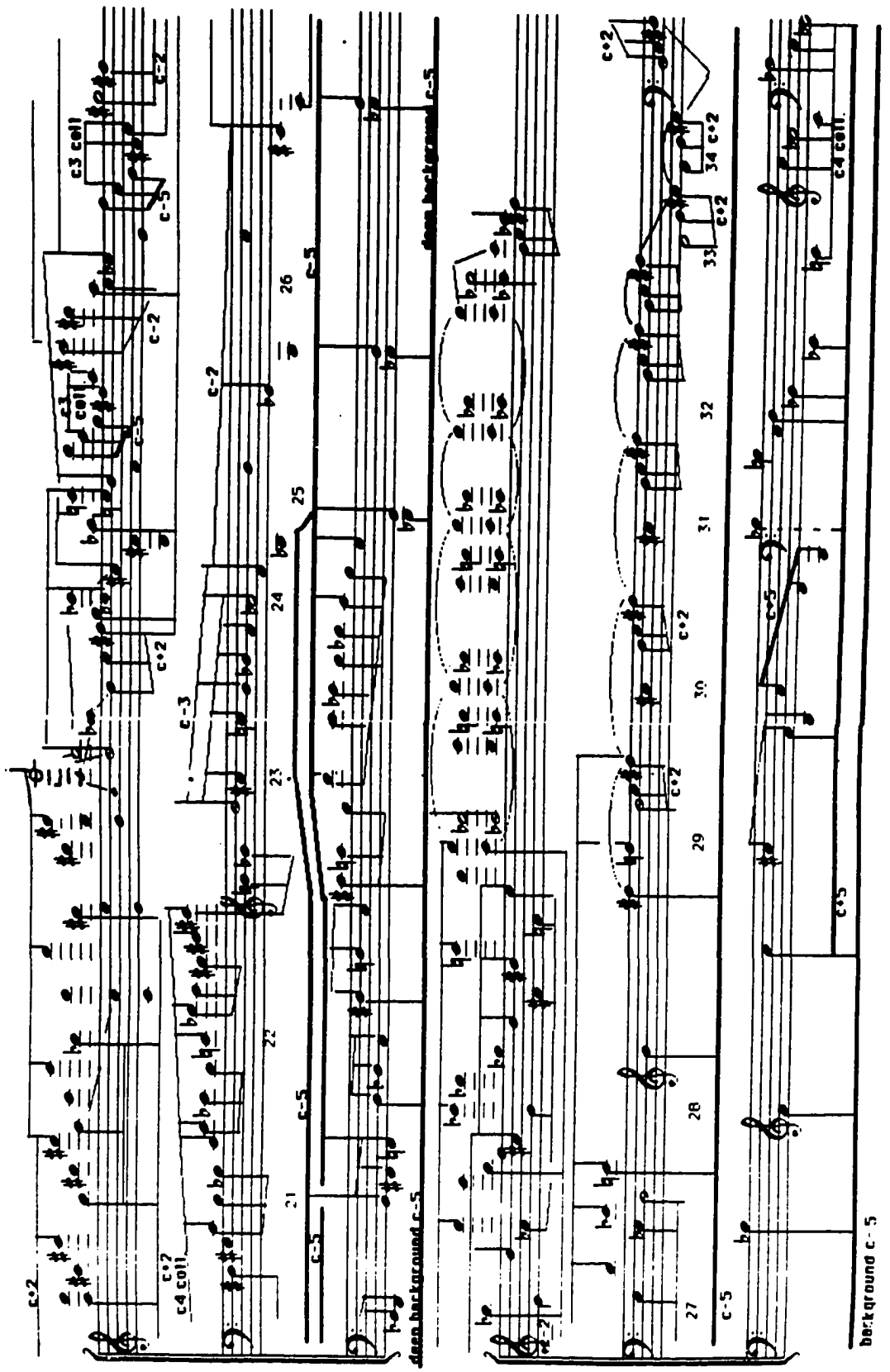


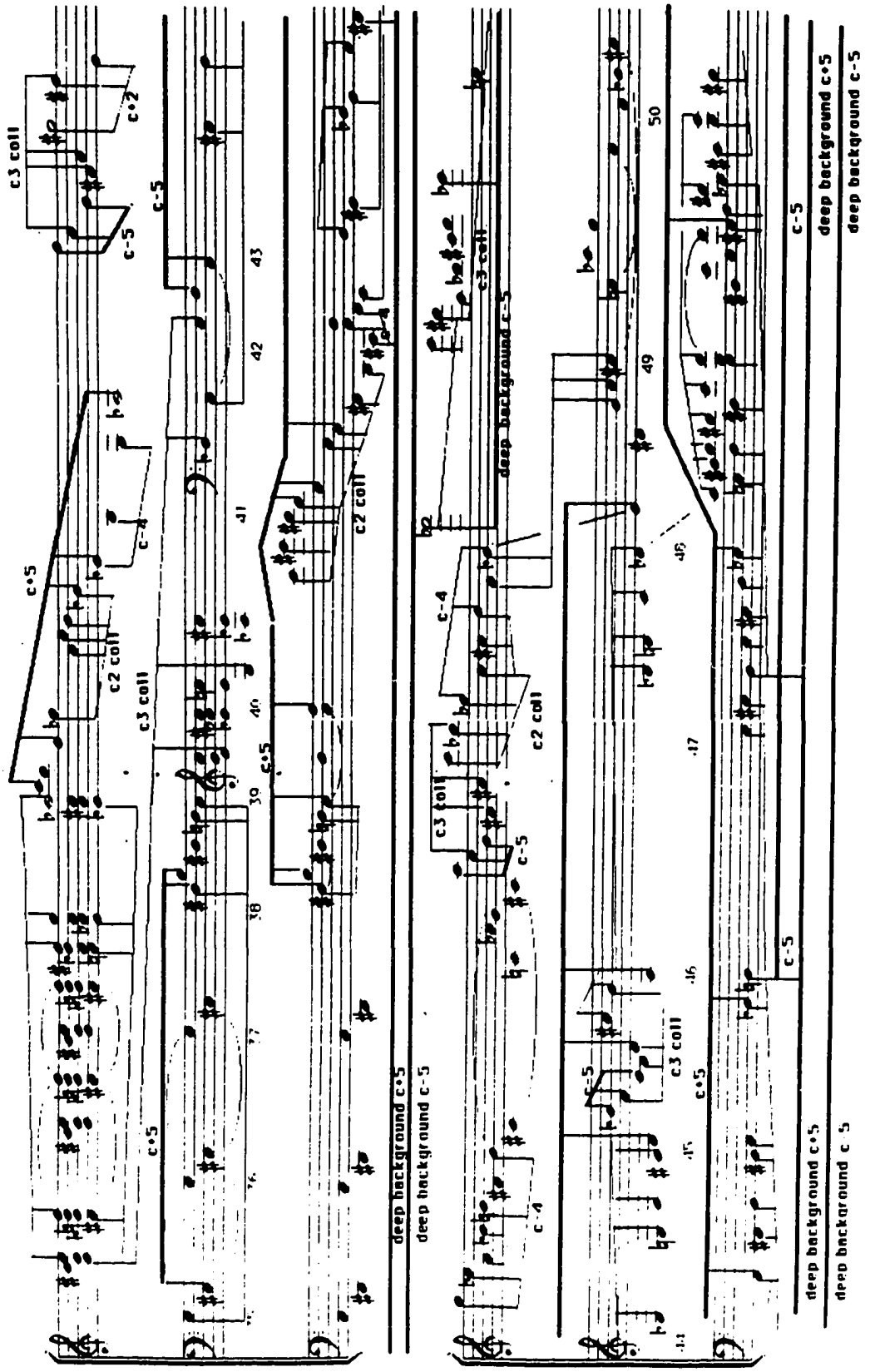


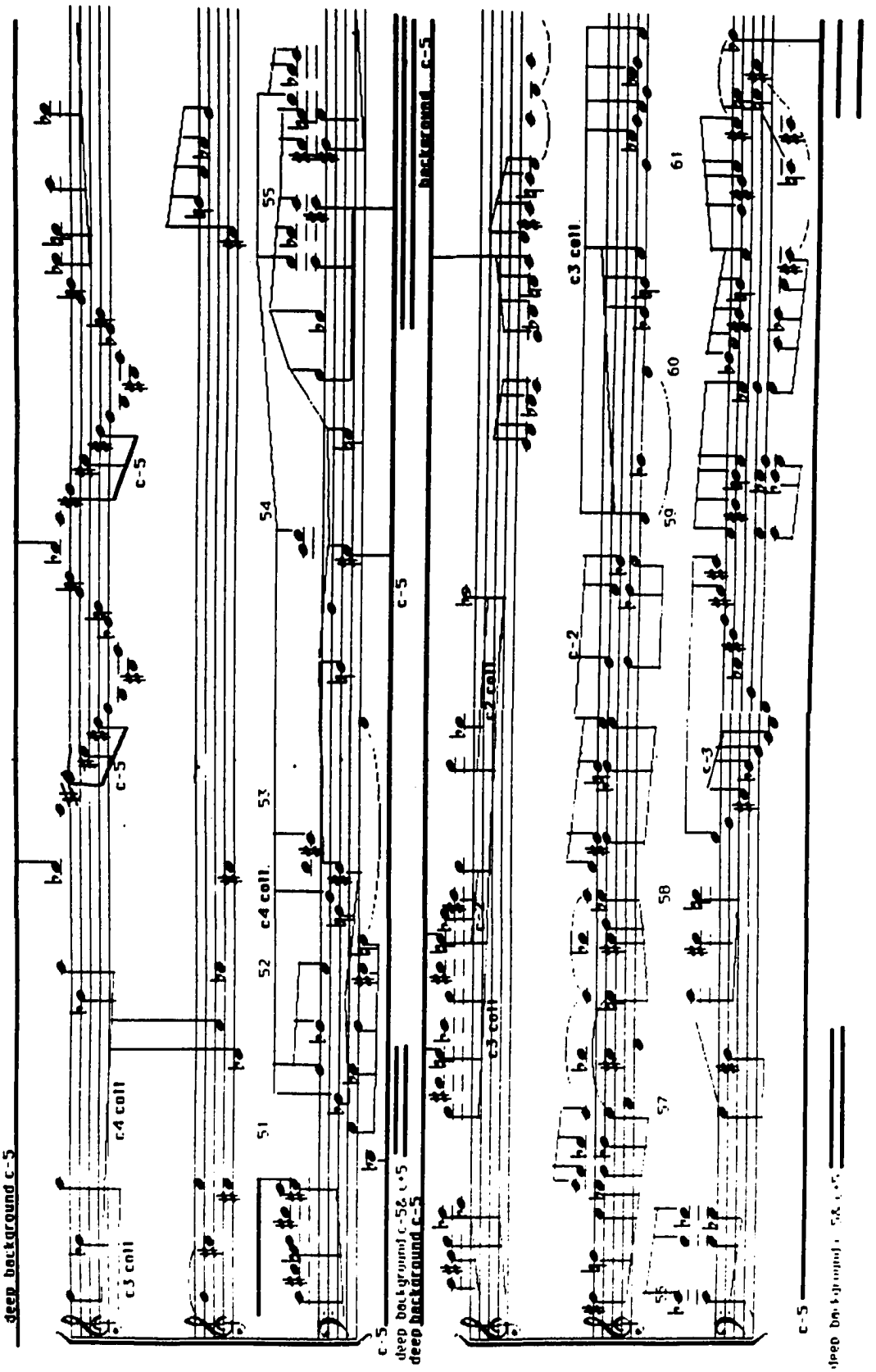


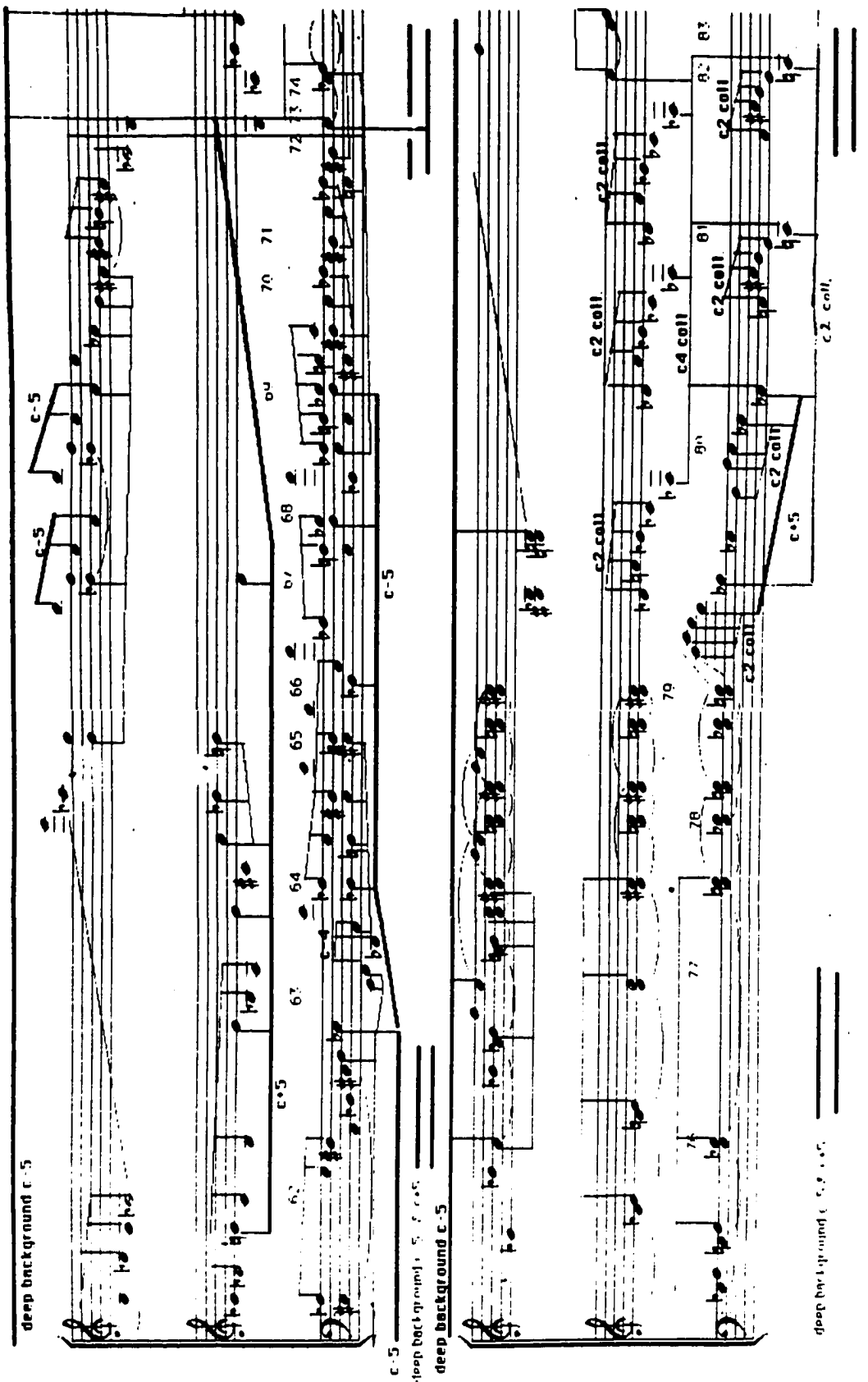
Graph X Second Movement Foreground

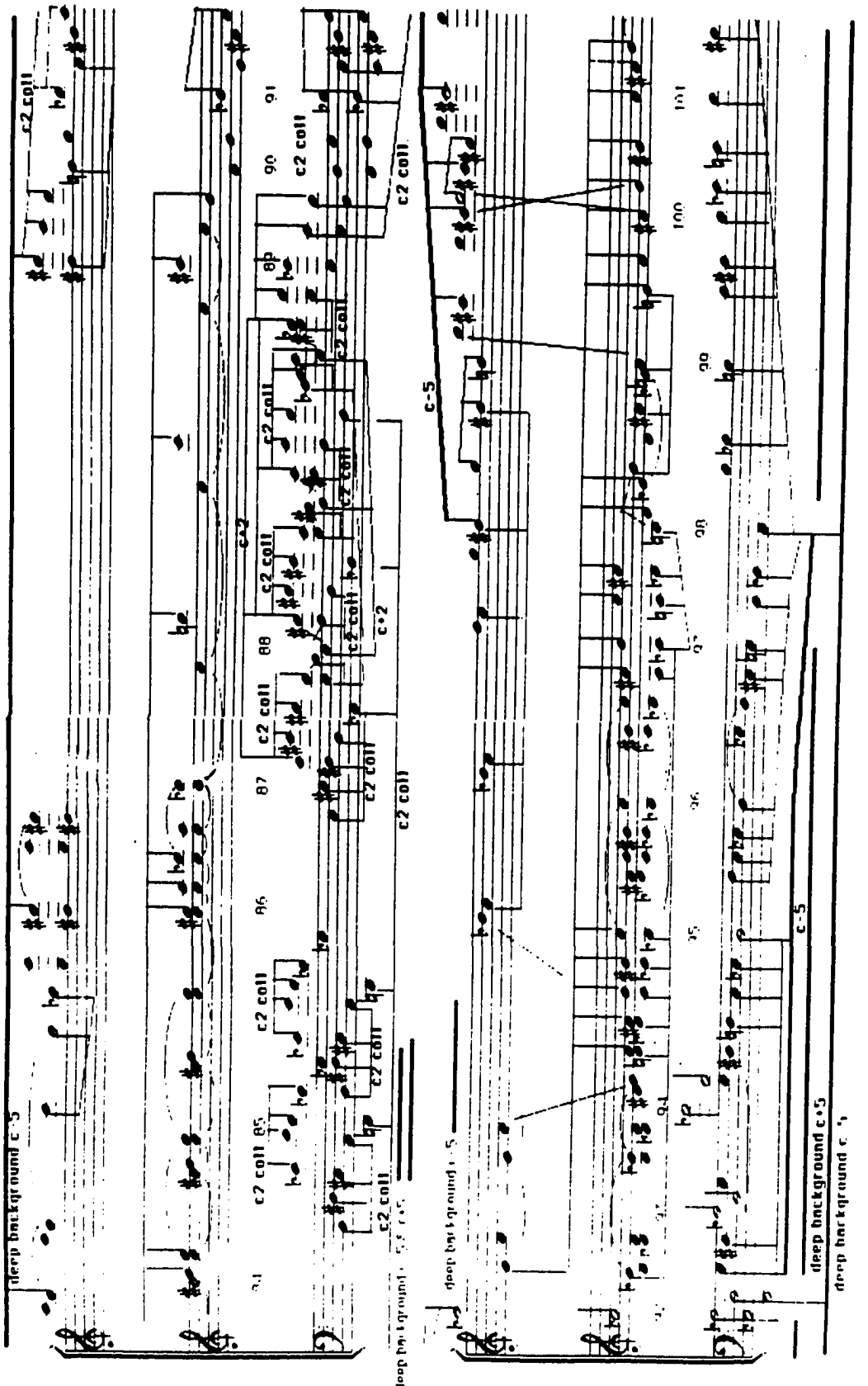


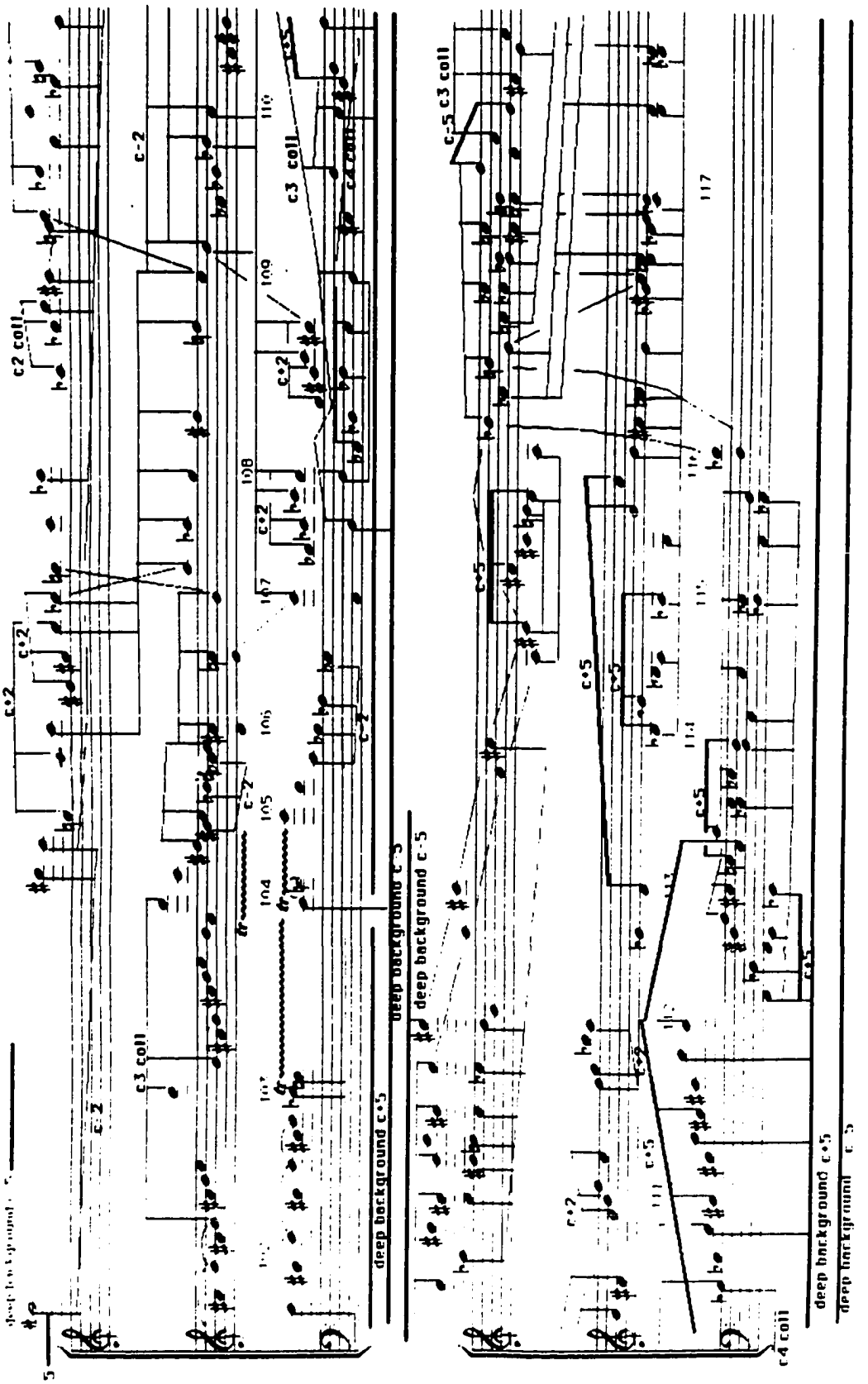


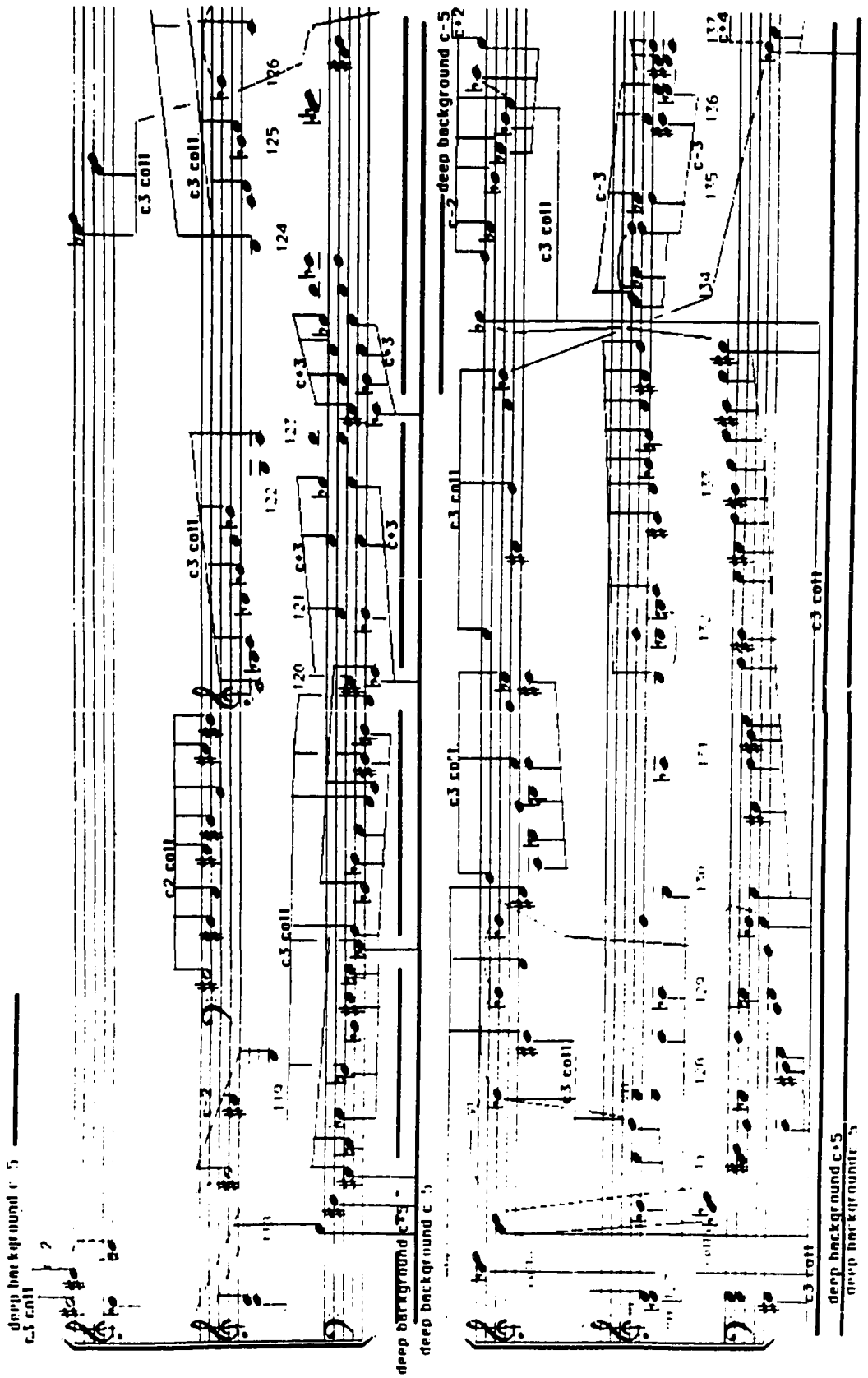


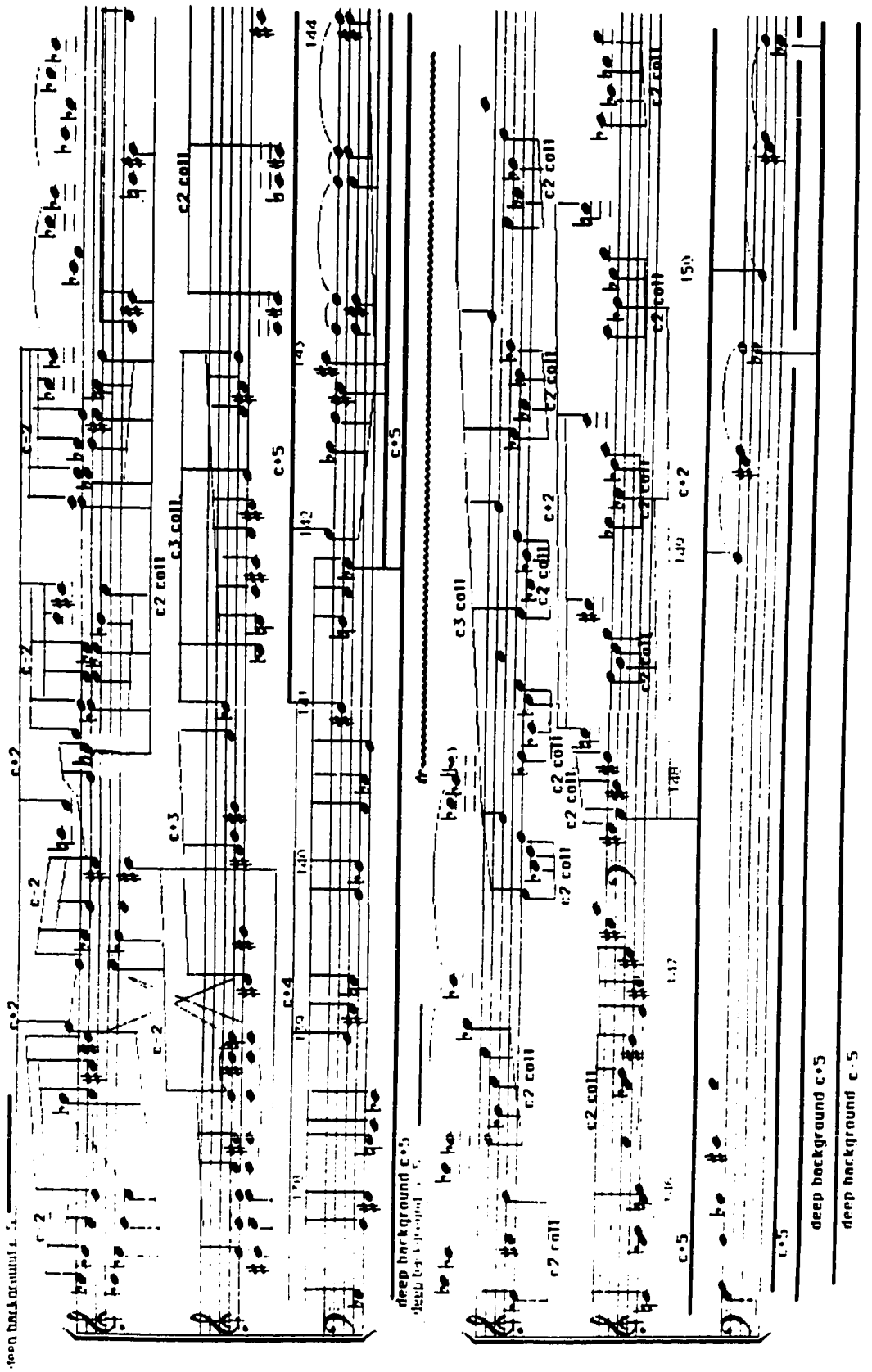


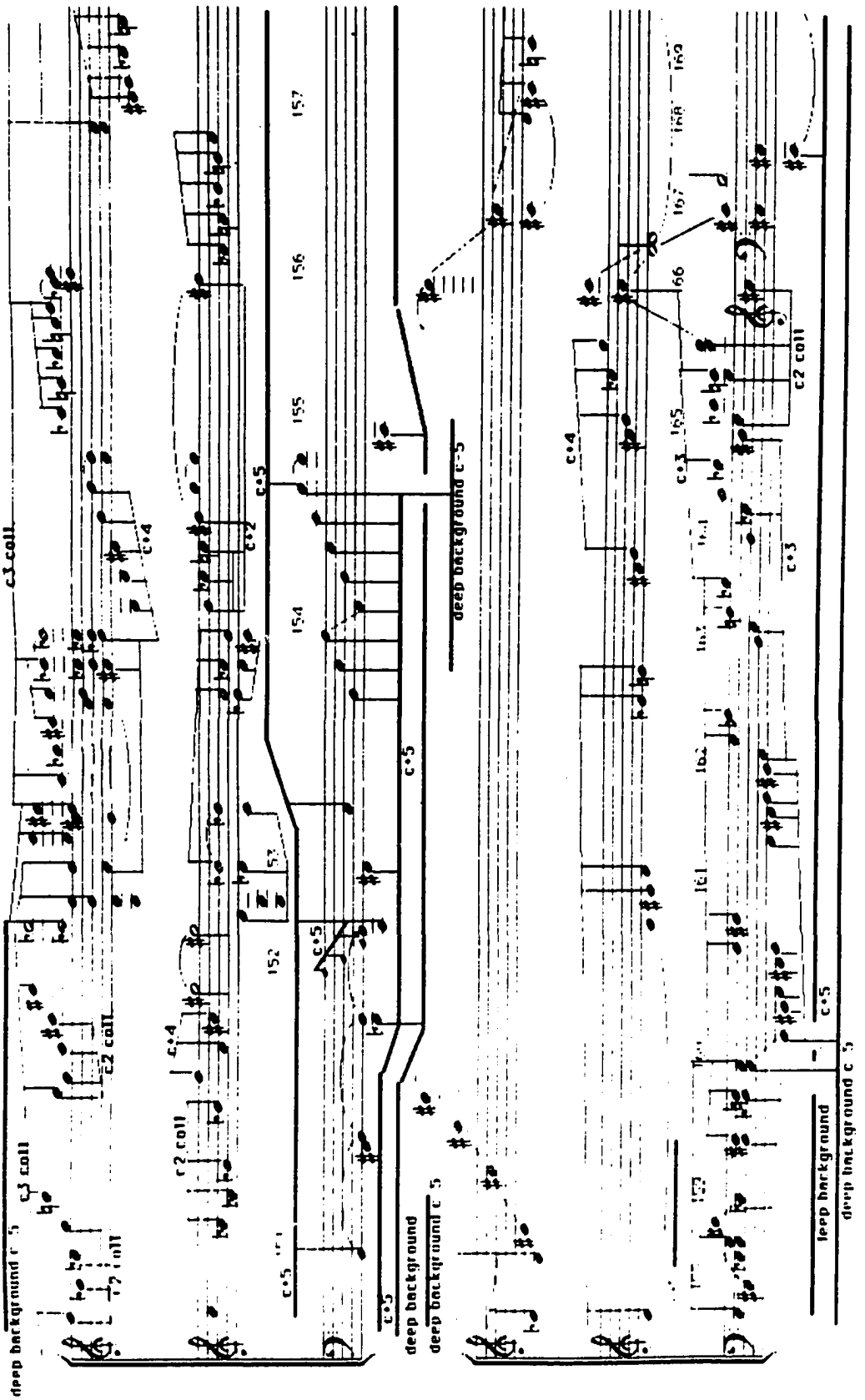


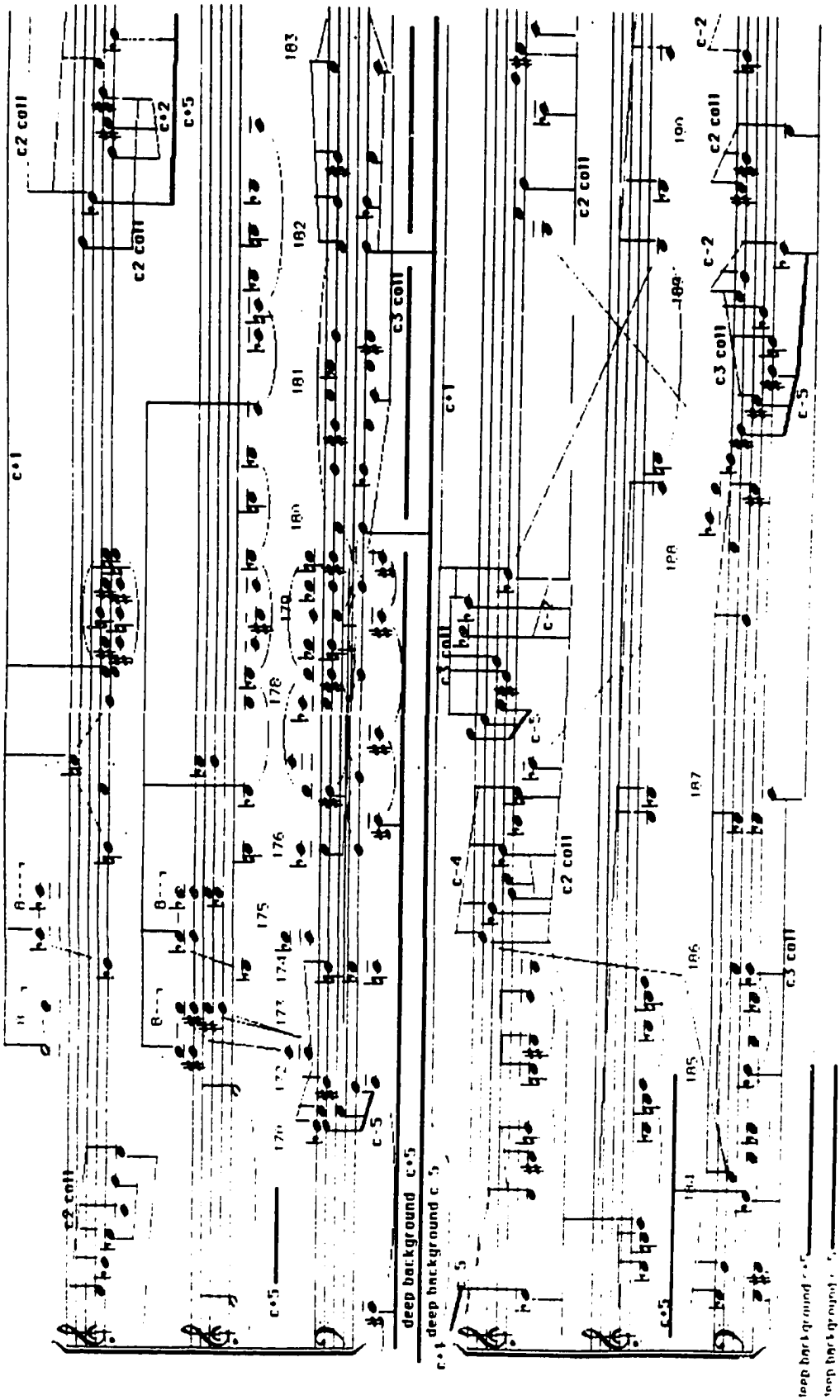


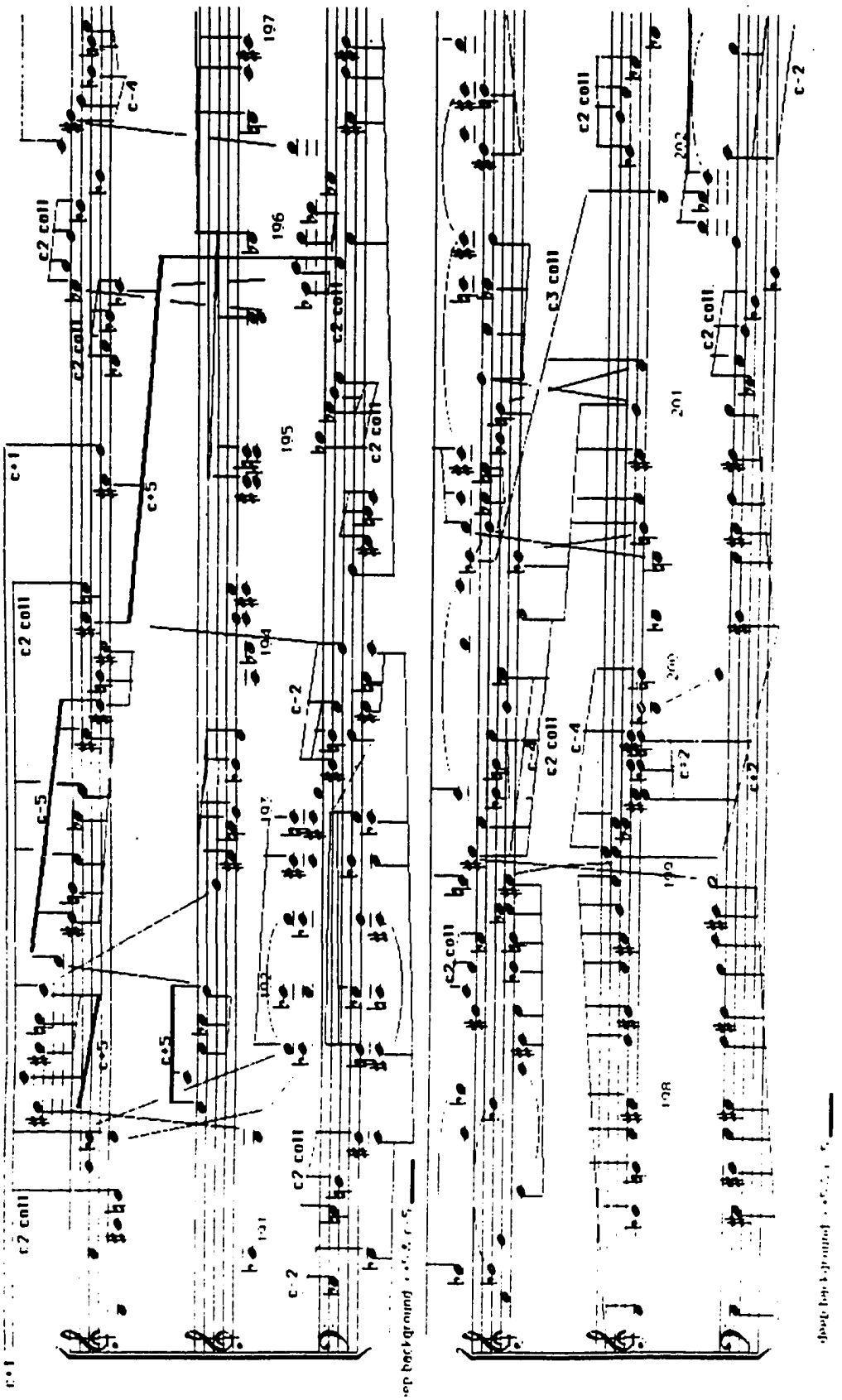


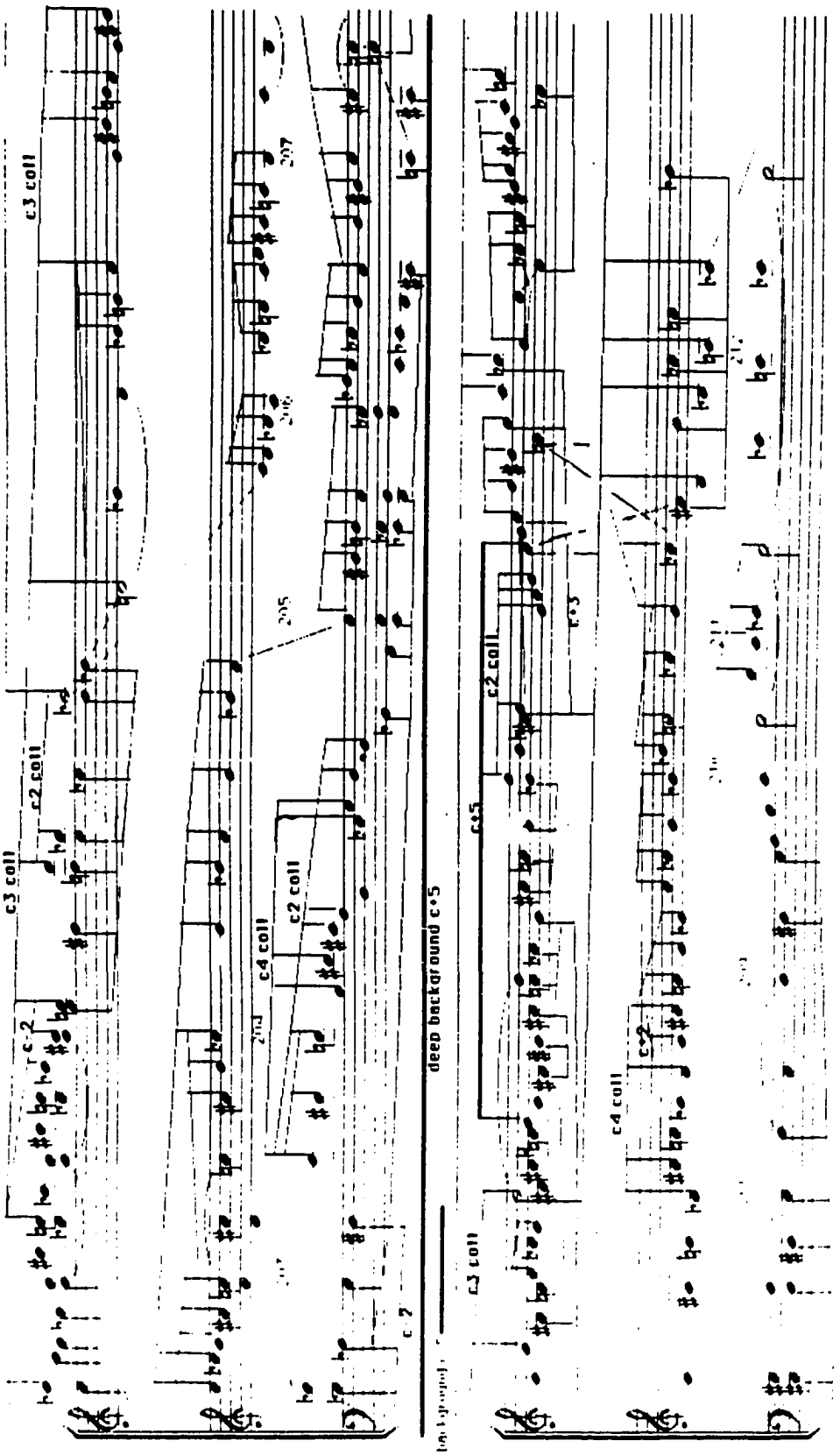


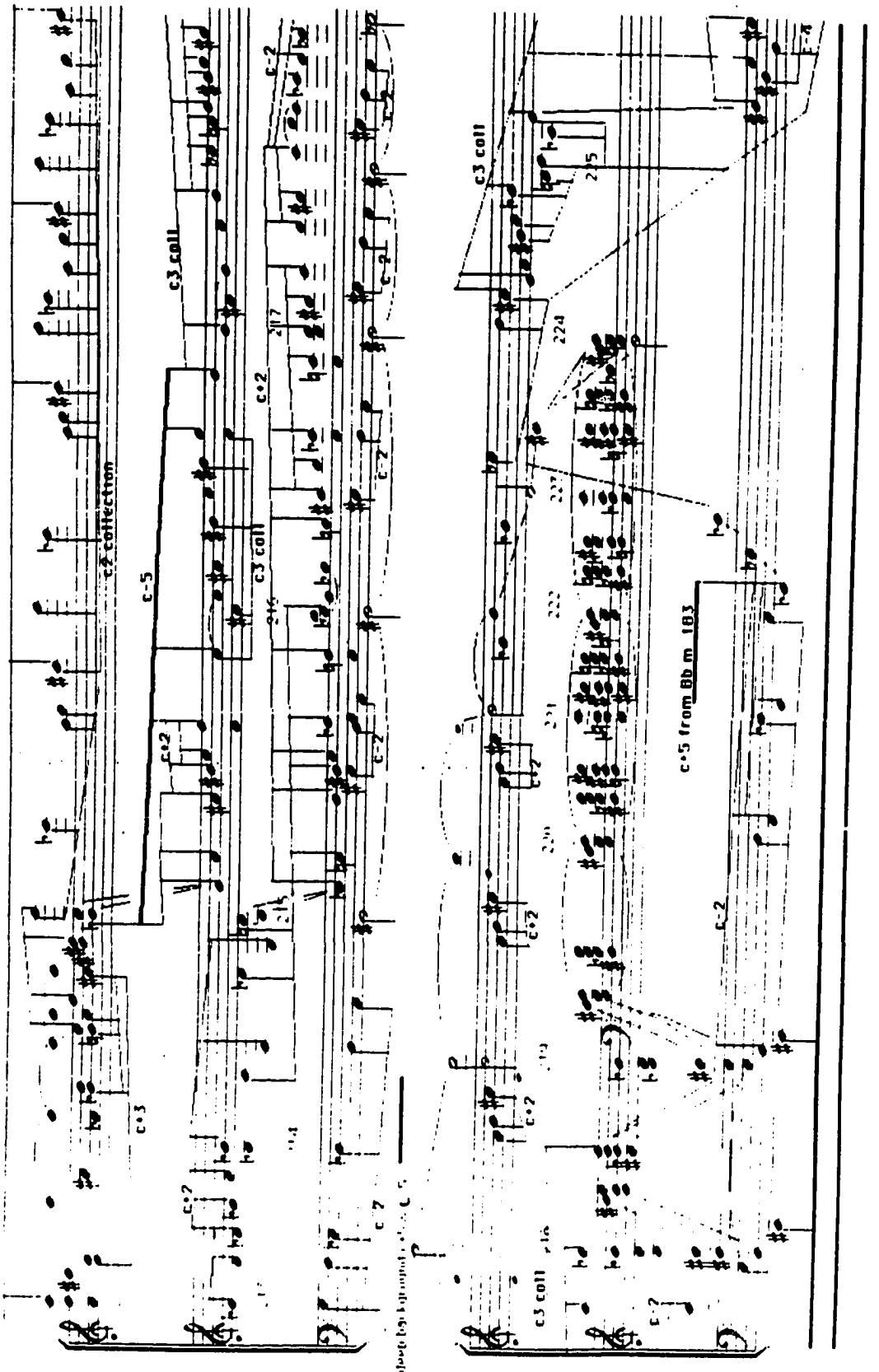


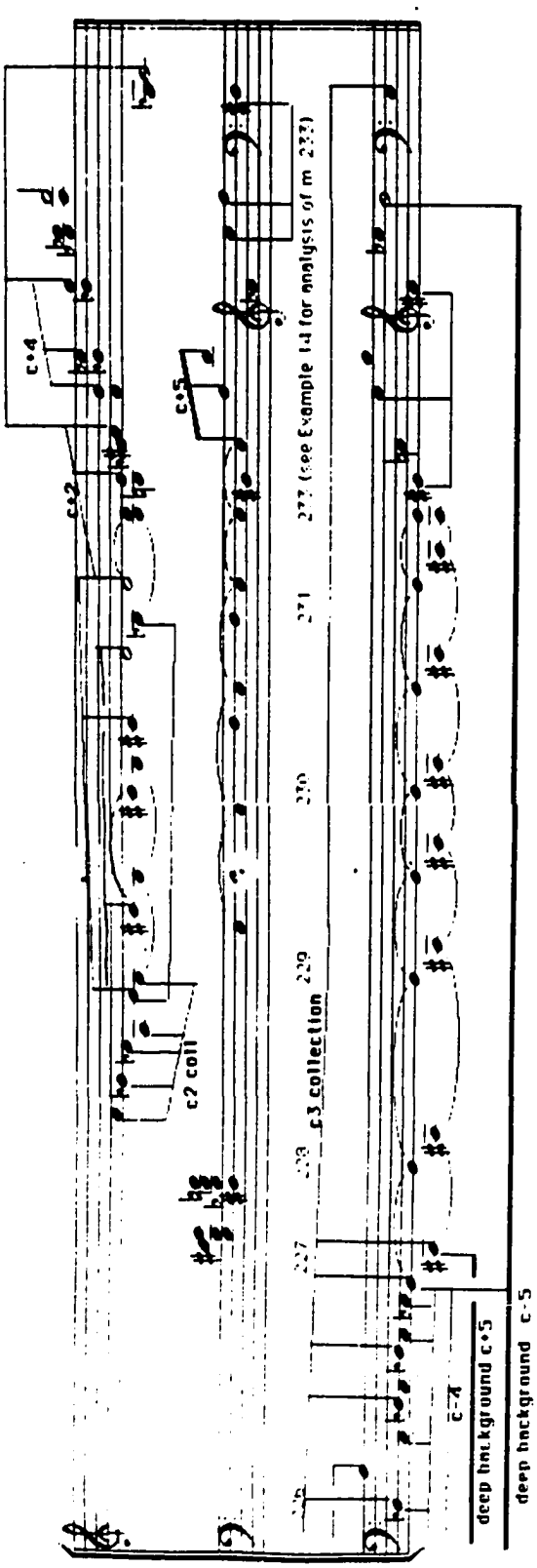








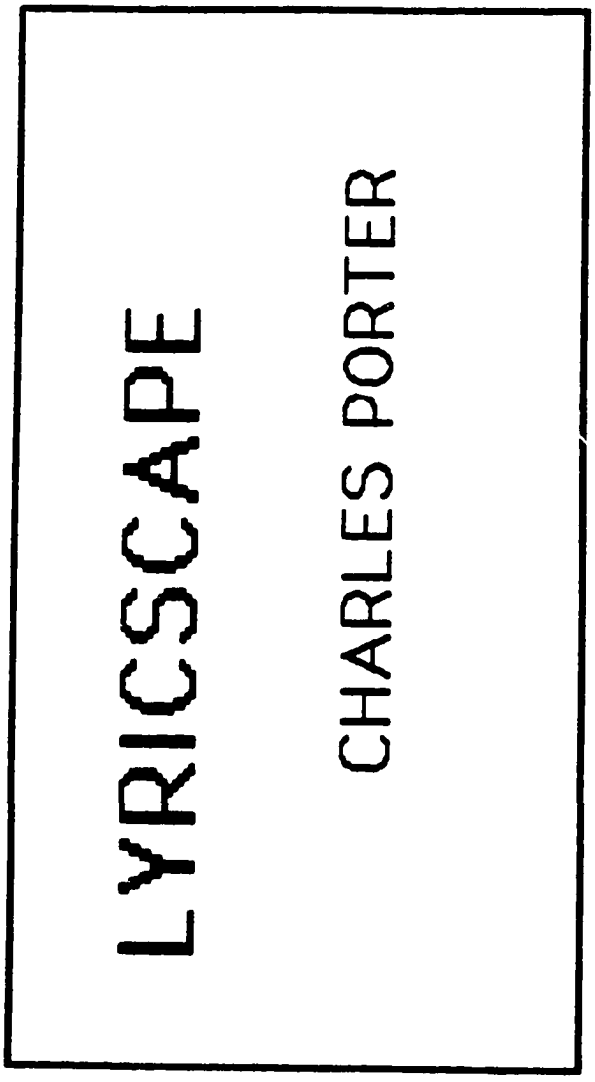




CHARLES PORTER

Charles Porter's Lyricscape for chamber orchestra was premiered during the 1988 Tanglewood Contemporary Music Festival. Mr. Porter was a composition fellow at Tanglewood and a resident artist at Yaddo in1987. He was the recipent of ASCAP awards in both1987 and 1988. In 1986 he was a resident artist at the PRO ARTE String Quartet Symposium in Madison ,WI and at the Composers' Conference in Long Beach, CA. His composition, Cyclic Celebration, was performed at the 29th Annual Meeting of the College Music Society in Miami, FLA in 1986 and Mr. Porter was a resident artist at the Charles Ives Center for American Music in New Milford, CT in 1984. In 1982 Mr. Porter was awarded a Charles Ives Scholarship by the American Academy and Institute of Arts and Letters and was also the recipient of a fellowship to the Johnson Composers Conference, an ASCAP Grant for young composers, and several grants from Meet the Composer. His composition, Fantasia, won the League of Composers -- International Society of Contemporary Music national composition competition in 1981. It was also selected for performance at the first Da Capo Chamber Players New Music Symposium at the the New School. Charles Porter's works have been performed throughout the United States and in Canada. The Da Capo Chamber Players, the Haydn-Mozart Chamber Orchestra, Infusion, The New York New Music Ensemble, The Odyssey Chamber Players, The Pittsburg New Music Ensemble, the Powell Quartet, the Pro Arte String Quartet, and ZOUNDS! are among the ensembles that have played his compositions.

Charles Porter (born March 29, 1952 in Cambridge, MA) began piano study with Julie Adams at age eight and started to compose at the age of twelve. He attended the Mannes College of Music Preparatory Department where he studied piano with David Goldberger. Mr. Porter earned his B.A. from Oberlin College, where he studied piano with Arthur Dann, and his M.A. in music composition from Queens College, where he studied composition with George Perle, Hugo Weisgall, and Henry Weinberg. He holds a Ph.D. from the City University of New York where he continued to study with George Perle. Mr. Porter resides in Brooklyn, N.Y. and teaches music at New York Technical College in Brooklyn and at Manhattan College in Riverdale, N.Y.



The Tanglewood Fellows Orchestra conducted by Carl St. Clair
premiered LYRICSCAPE on August 6, 1988
at the Tanglewood Festival of Contemporary Music, Lenox,MA.

All instruments sound as notated with the exception of the piccolo and xylophone which sound an octave higher, the crotales which sound two octaves higher, and the string basses which sound one octave lower.

INSTRUMENTATION

2 flutes (II doubling on piccolo)
2 oboes (II doubling on English horn)
2 Bb clarinets (II doubling on bass clarinet)
2 bassoons

2 horns in F
1 trumpet in C
1 tenor trombone
1 bass trombone

Percussion I
3 timpani (32 in., 29 in., and 26 in.)
5 woodblocks (high to low) shared with percussion II

Percussion II
xylophone
3 tom-toms (high to low)
5 woodblocks (high to low) shared with percussion I
crotales (high octave)
small tom-tom
large suspended cymbal

strings (at least 6.6.4.4.2; basses require C extension)

Duration: approximately 15 minutes

PERCUSSION SET UP