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Listening to Babbitt

Joseph N. Straus
CUNY Graduate Center

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LISTENING TO BABBITT

JOSEPH N. STRAUS

BUT CAN YOU hear it?” Whenever a musical analysis pushes beyond the most obvious surface relationships, this question is likely to be asked. Milton Babbitt’s answer is uncompromising, even dismissive: “Of course you can hear it, but it’s not a matter of hearing. It’s a matter of the way you think it through conceptually with your musical mind; it’s a matter of how you conceptualize, how you conceive it.” But some kinds of relationships are easier to conceptualize than others. Furthermore, different kinds of relationships require different kinds of listening skills to make them palpable. For example, it is probably no harder to conceive the transpositional equivalence of two dyads than that of two hexachords, but certainly, under most musical circumstances, it would be easier to hear the equivalence of the dyads in the direct, physical way that most people mean when they talk about hearing something.

The relationships described by most analyses of Babbitt’s music are hard to
Listening to Babbitt

hear. They require listening abilities that few people possess in any large measure. It is hard to recognize an aggregate. It is hard to identify and equate large unordered sets of pitch classes. It is hard to recognize order transformations applied to long lines of pitch classes. At the same time, most people familiar with Babbitt's music (as opposed to what his music is supposed to stand for) find the experience of listening a rewarding and comprehensible one. I believe that, to a large extent, such rewards and comprehensions come from musical relationships that are relatively easy to hear, like up and down (contour), high and low (register), loud and soft (dynamics), short and long (rhythm), staccato and legato (articulation). Taken in conjunction with the directed pitch-class interval, these relationships provide a relatively accessible way of hearing a path through Babbitt's music.

The discussion that follows will take a listener-oriented, not a composer-oriented approach, and will concentrate on how a single passage of Babbitt's music, the first eighteen measures of the String Quartet No. 2, might be taken in, not on how it might have been made. Instead of beginning with prepositional materials (sets and arrays) and showing how they are musically concretized, we will begin with certain striking attractions of the musical surface. Furthermore, our efforts won't be directed toward deducing the underlying sets and arrays, a goal Babbitt himself derides as a sterile form of musical cryptanalysis. Instead, we will indulge ourselves in the abundant pleasures of the surface. Like any guided tour, this "Listener's Guide" will trace only one of many possible paths through a rich edifice. We will concentrate on what lies directly along our path. At the same time, we will happily point out attractions in other, more distant parts of the edifice both for their intrinsic beauty and for their suggestion of paths we might have taken and might take on some subsequent visit.

Listen to the first eighteen measures of Babbitt's Quartet No. 2. This passage presents a remarkably varied musical surface. We will try to appreciate some of this variety even as we listen for coherent patterns just beneath the surface. Sound Example 1 contains a performance of this passage by the Queens String Quartet. Let us begin by orienting ourselves in measures 1-3. This passage involves pairs of instruments playing pairs of notes. We hear a kind of modified unison texture, with one new pitch-class at a time stated simultaneously by two instruments. The first violin is paired with the viola and the second violin with the cello. Each instrumental duet plays three pairs of notes. The first two pairs of notes are played one at a time and slurred, while the third pair is a simultaneity. In Sound Example 2, you will hear each instrumental duet alone (first violin–viola, then second violin–cello) and then measures 1–3 as a whole.

Let us listen more closely to the contours in measures 1–3. In the pairs of
String Quartet No. 2
Milton Babbitt
(1954)

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slurred notes, the instruments sometimes play in an upward direction, sometimes in a downward direction:

- Violin 1: up down
- Violin 2: down up
- Viola: down down
- Cello: up up

All four possible arrangements of up and down are thus expressed in what Babbitt calls "the spirit of maximum variety." Listen in Sound Example 3 to this variety of contours in measures 1–2, each instrument with its own distinctive pattern of up and down. This may be difficult to hear in a recorded performance, but in a live performance, one's eyes would assist one's ears.

In all four instruments, each slurred pair of notes states either the interval of a minor third (or minor tenth) or its inversion, the major sixth. As with the instrumental contours, all four arrangements of these two intervals are used:

- Violin 1: m3 M6
- Violin 2: M6 m3
- Viola: M6 M6
- Cello: m3 m3

Furthermore, the contours and the intervals are associated with each other—the thirds (and tenths) are always stated with an upward contour and the sixths are always stated with a descending contour. Ascending minor thirds (and minor tenths) and descending major sixths are, of course, representatives of a single directed pitch class interval, + 3, so there is a strong underlying intervalllic unity here. In Sound Example 4, you will hear first the thirds (and tenths), then the sixths, and then measures 1–2 as a whole.

As a result of this intervalllic variety (within the prevailing fixation on the directed pitch class interval + 3), the simultaneously-stated notes are at varying distances. Some are an octave apart, some are two octaves apart, and some are three octaves apart. Let us see how this pattern of octave distances works:

<table>
<thead>
<tr>
<th>Pitch-class:</th>
<th>A</th>
<th>C</th>
<th>B</th>
<th>D</th>
<th>F</th>
<th>Ab</th>
<th>G</th>
<th>Bb</th>
<th>C#</th>
<th>E</th>
<th>Eb</th>
<th>Gb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
Each of the six note-pairs has a different pattern of octave distances, thus distinguishing them and emphasizing the $+3$ they create. All six possible patterns (unordered) of 1, 2, and 3 are used, again reflecting a spirit of maximum variety, operating here within a very narrow intervallic focus. Listen in Sound Example 5 for the varying octave distances between the simultaneously-stated notes and the distinctive pattern of octave distances associated with each note-pair.

We now turn our attention to the dynamics. Four different levels are used: $pp$, $mp$, $mf$, and $ff$. Each of these levels occurs twice in the passage, affecting one slurred or simultaneous pair of notes and one single note. Notice that the instrumental duets use different dynamics: first violin and viola use $mp$ and $ff$ while second violin and cello use $pp$ and $mf$. This contributes to our sense of the distinction between the instrumental pairs, reflected also in their pitches and rhythms. Each instrumental pair is assigned one relatively soft dynamic ($pp$ or $mp$) and one relatively loud dynamic ($mf$ or $ff$).

Within each instrumental duet, the first note-pair is soft, the second goes from loud to soft, and the third is loud. Because the duets alternate their statements, the result is a nice echo effect: The first note-pair in the passage is soft, the second is softer; the third note-pair goes from loud to soft, the fourth does the same thing more quietly; the fifth is loud, the sixth is less loud. Listen in Sound Example 6 for the dynamic succession within each duet and for the dynamic echos between the duets.7

We can get some additional refinement by considering the actual dynamics rather than just the relationships of softer and louder. Three pitch-classes occur at each of the four available dynamic levels. Let us observe the succession of ordered pitch-class intervals at each dynamic level.

\[
\begin{align*}
pp: \quad B &\quad D &\quad Bb &= +3, -4 \\
mp: \quad A &\quad C &\quad Ab &= +3, -4 \\
mf: \quad G &\quad Eb &\quad Gb &= -4, +3 \\
ff: \quad F &\quad C\# &\quad E &= -4, +3
\end{align*}
\]

At both of the softer levels, the succession is $+3, -4$; at both of the louder levels, the succession is reversed: $-4, +3$. While the surface succession of notes gives us repeated statements of $+3$, the dynamics suggest combinations of $+3$ with a new interval, $-4$. These combinations, and related combinations of $-3$ and $+4$, are reflected in other dimensions in this passage and become central to the organization of measures 7–18. The music does one thing overtly while simultaneously suggesting something else. To hear it most richly, we need to listen both retrospectively (hearing events in relation to events we have already heard) and prospectively (hearing events in terms of what they might suggest for some future musical moment). It can be hard to associate notes based
on shared dynamic level. To make it a bit easier, concentrate on the dynamic extremes: \textit{pp} and \textit{ff}. In Sound Example 7 you will hear first the notes marked \textit{pp}, then the notes marked \textit{ff}, and finally measures 1–3 as a whole.

Finally, let us look at (and listen to) some aspects of the use of register in the passage. We have talked about how notes are grouped via contour and dynamics. It is also possible to hear the notes grouped according to which are higher and which lower. Let us consider just a few instances. The lowest three notes in the cello (B, G, B♭) describe the intervallic succession $-4, +3$. The next highest three notes, also in the cello, describe the succession $+4, -3$, or the inversion of the succession in the lowest three notes. The highest three notes in the first violin (all marked \textit{ff}) describe the succession $-4, +3$, same as the lowest three notes in the cello. (The highest note in the passage is the G♭ in the second violin, so the successions I am describing involve register within a single instrument). The next highest three notes in the first violin (all marked \textit{mp}) describe $+3, -4$. We might expect the one remaining possible ordering of these intervals ($-3, +4$) to be registrally isolated somewhere else in the passage, but it isn’t. The viola’s upper three notes describe $-4, +3$ and its lower three describe $+4, -3$. The registral distribution in the second violin has an entirely different intervallic succession, one which is important in the piece but would lead us too far from our present path. As with the dynamic associations discussed above, it can be difficult to hear notes associated by register. Let us focus on the registral extremes and listen in particular to the first violin and cello. In Sound Example 8, you will hear the cello part (first its lowest three notes, then its highest three notes), the first violin part (first its lowest three notes, then its highest three notes), and finally measures 1–3 as a whole with all four instruments playing.

The next passage, measures 4–6, is more varied than measures 1–3, but it still contains those familiar pairs of slurred notes. Let us concentrate first on these. There are six of them in the passage, three in each instrumental duet. Notice the nice balance of upward and downward contour: three upward slurs alternate with three downward slurs. This distinction between up and down reinforces the instrumental pairing we noticed earlier, in that the first violin and viola have only upward slurs and the second violin and cello have only downward slurs. There is an intervallic distinction here as well. The first violin and viola play only ascending minor sixths while the second violin and cello play only descending major thirds (or tenths). This is a reversal of measures 1–3 where the first violin-viola duet played the thirds (and tenths) while the second violin-cello duet played the sixths. There is an even more fundamental intervallic difference between these two passages. In measures 1–3, the intervals between slurred notes were members of directed pitch class interval $+3$. In measures 4–6, the intervals between slurred notes are members of directed pitch class interval $-4$. Listen in Sound Example 9 to the pairs of slurred notes in measures 4–6 and concentrate on the instrumental pairing, the contours, and the distinction
between descending major thirds (and tenths) and ascending minor sixths within a prevailing preoccupation with ordered pitch interval $-4$.

In measures 1–3, the slurred statements of $+3$ were followed by simultaneous statements of that interval. A similar thing happens in measures 4–6. Each instrumental duet contains three slurred $-4$s and, in measure 6, a single simultaneous 4. In Sound Example 10, you will hear the slurred and simultaneous $-4$s in the first violin and viola, then the slurred and simultaneous $-4$s in the second violin and cello, and finally all of these $-4$s in all four instruments.

We have not yet discussed the eight single notes in measures 4–6. Each of these is an octave doubling of some note we have discussed and these doublings give this passage the same modified unison texture as measures 1–3. Also as in measures 1–3, the doubling always occurs within the familiar instrumental duets. Each instrument has two of these doubling notes and two pairs of notes (either slurred or simultaneous) and, again in the spirit of maximum variety, the ordering of these is different for each instrument.

\[
\begin{align*}
\text{Violin 1:} & \quad 1 \ 2 \ 1 \ 2 \\
\text{Violin 2:} & \quad 1 \ 2 \ 2 \ 1 \\
\text{Viola:} & \quad 2 \ 1 \ 2 \ 1 \\
\text{Cello:} & \quad 2 \ 1 \ 1 \ 2
\end{align*}
\]

We have already discussed the pairs of notes (slurred or simultaneous) in each part and observed that in each case the interval formed is a $-4$. Now notice that each of the eight doubling notes creates an additional statement of $-4$ within each instrument. Each doubling note lies either 4 above the following note or 4 below the preceding note. In the second violin, for example, the single note E is 4 above the next note in that instrument while its single Db (in measure 6) is 4 below the immediately previous F. For the six notes in each instrumental part, then, the first two intervals and the last two will be $-4$. In Sound Example 11, you will hear each instrumental part in turn and then measures 4–6 complete. Listen in particular for articulative pattern and intervallic succession within each instrumental part.

As in measures 1–3, dynamics play an important role in shaping the musical structure. In fact, measures 4–6 use the four dynamic levels fff, f, p, and ppp much the same way as measures 1–3 used the levels ff, mf, mp, and pp. As before, the instrumental pairs are distinguished by the dynamic levels they use: first violin and viola use p and ppp in alternation and second violin and cello use fff and f in alternation. And, as in measures 1–3, there are three pitch-classes at each dynamic level, describing the two arrangements of intervals 4 and 3 ($+4$, $-3$ and $-3$, $+4$) that were not described by the dynamics in measures 1–3.\[\text{footnote}^{11}\]
In measures 1–3, these dynamically-defined successions occur beneath a surface presentation of ordered pc interval + 3. In measures 4–6, the same successions occur, but this time beneath surface presentation of −4. Measures 1–6 as a whole present +3 then −4 while, at the same time, the dynamics express various permutations of those intervals. The dynamic partitioning is difficult to hear and, in measures 4–6, is further complicated by two slight departures from the scheme shown above. This being so, you will hear first in Sound Example 12 just the notes marked ppp and then the passage as a whole. Try to hear that particular dynamically partitioned statement of −3, +4 within the passage as a whole.

In the next large section of music, measures 7–18, the texture changes dramatically. The octave doublings of measures 1–6 are abandoned and the instruments are much more independent. Let us focus our attention first on measures 7–9 since many of its organizational features hold throughout the passage. In Sound Example 13, you will hear measures 7–9. Notice that each instrument plays two of the now well-known patterns involving the directed pitch-class intervals 3 and 4:

<table>
<thead>
<tr>
<th>measures:</th>
<th>7</th>
<th>8–9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violin 1:</td>
<td>+3, −4</td>
<td>−3, +4</td>
</tr>
<tr>
<td>Violin 2:</td>
<td>−4, +3</td>
<td>+4, −3</td>
</tr>
<tr>
<td>Viola:</td>
<td>−3, +4</td>
<td>+3, −4</td>
</tr>
<tr>
<td>Cello:</td>
<td>+4, −3</td>
<td>−4, +3</td>
</tr>
</tbody>
</table>

The instrumental duets from measures 1–6 are still at work here. The first violin and viola use (+3, −4) and (−3, +4) while the second violin and cello use (−4, +3) and (+4, −3). Not only are the interval patterns shared within the instrumental duets, but so are the actual pitch classes used. The first violin in measure 7 has the same three-note group as the viola in measure 8, and vice versa. The same is true of the second violin and cello. The result is a kind of voice exchange within each instrumental duet.
Listen for these exchanges of interval succession and pitch-class content in Sound Example 14, where you will hear first the duet between first violin and viola, then the duet between second violin and cello, and finally measures 7–9 as a whole.

As in measures 1–6, the basic intervals 3 and 4 are sometimes represented by their compounds and inversions. As a result, some of the three-note groupings are in the closest possible spacing and some are not. Each instrument has a distinctive pattern of close and open spacing:

\[
\begin{align*}
\text{m. 7} & & \text{mm. 8–9} \\
\text{Violin 1:} & & \text{close} & & \text{close} \\
\text{Violin 2:} & & \text{close} & & \text{open} \\
\text{Viola:} & & \text{open} & & \text{open} \\
\text{Cello:} & & \text{open} & & \text{close}
\end{align*}
\]

Notice the balance within each duet—each close position in one instrument is answered by an open position in its instrumental partner, and vice versa. The first violin has two statements in close position; the viola has two statements in open position. The second violin has a close then an open statement; the cello has an open then a close statement.

If you listen closely to the articulations (staccato versus legato) you will notice that, as with the spacing, each instrument has a distinctive pattern while balance is maintained within the instrumental duets. In measure 7, each instrument plays three notes, some marked staccato and some either slurred or marked legato:

\[
\begin{align*}
\text{Violin 1:} & & \text{stac.} & & \text{leg.} & & \text{leg.} \\
\text{Violin 2:} & & \text{leg.} & & \text{leg.} & & \text{stac.} \\
\text{Viola:} & & \text{leg.} & & \text{stac.} & & \text{stac.} \\
\text{Cello:} & & \text{stac.} & & \text{stac.} & & \text{leg.}
\end{align*}
\]

In Sound Example 15, you will hear first the first violin–viola duet, then the
second violin–cello duet, and finally measures 7–9 as a whole. Listen for the balanced patterns of spacing and articulation within each duet and, if possible, for the ways in which these patterns reinforce the intervallic balance discussed above.

Furthermore, the articulatively associated notes in each instrumental duet reinforce the intervallic development. Within each duet, the staccato notes outline the succession +4, +4 while the legato notes outline −4, −4. In measures 8–9, where the voices exchange, the legato notes become staccato and vice versa so the legato notes now state +4, +4 while the staccato notes state −4, −4. Let us hear how this works in just the first violin–viola duet. In Sound Example 16, you will hear these two instruments play first their staccato notes, then their legato notes, then all their notes in measures 7–8.

Measures 7–18 as a whole continue along the lines we have discussed in measures 7–9. The preoccupation with intervallic patterns involving 3 and 4 continues and intensifies.14

<table>
<thead>
<tr>
<th>measures:</th>
<th>7</th>
<th>8–9</th>
<th>10–11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violin 1:</td>
<td>+3, −4</td>
<td>−3, +4</td>
<td>−4, +3</td>
<td>+4, −3</td>
</tr>
<tr>
<td>Violin 2:</td>
<td>−4, +3</td>
<td>+4, −3</td>
<td>+3, −4</td>
<td>−3, +4</td>
</tr>
<tr>
<td>Viola:</td>
<td>−3, +4</td>
<td>+3, −4</td>
<td>+4, −3</td>
<td>−4, +3</td>
</tr>
<tr>
<td>Cello:</td>
<td>+4, −3</td>
<td>−4, +3</td>
<td>−3, +4</td>
<td>+3, −4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>measures:</th>
<th>13</th>
<th>14</th>
<th>15–16</th>
<th>17–18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violin 1:</td>
<td>−3, +4</td>
<td>+3, −4</td>
<td>+4, −3</td>
<td>−4, +3</td>
</tr>
<tr>
<td>Violin 2:</td>
<td>+4, −3</td>
<td>−4, +3</td>
<td>−3, +4</td>
<td>+3, −4</td>
</tr>
<tr>
<td>Viola:</td>
<td>+3, −4</td>
<td>−3, +4</td>
<td>−4, +3</td>
<td>+4, −3</td>
</tr>
<tr>
<td>Cello:</td>
<td>−4, +3</td>
<td>+4, −3</td>
<td>+3, −4</td>
<td>−3, +4</td>
</tr>
</tbody>
</table>

Here is the spirit of maximum variety with a vengeance. Not only does each instrument play all four possible successions twice, but all four possibilities also occur between instruments, within the columns in the diagram. In the music, these vertical groupings generally occur within a single measure or within a pair of measures. This begins to explain the metrical organization and the position of the bar-lines: they articulate complete between-instrument groupings of the four possible orderings of 3 and 4. It is difficult to keep the between-instrument groupings and the within-instrument groupings in mind at the same time, but it
is easy enough to hear them one at a time. In Sound Example 17, you will hear measures 7–18 played twice. The first time, listen for the patterns within each instrument (you will probably find it easiest to concentrate on one of the outer voices while you follow the chart above). The second time, listen for the between instrument groupings.

Throughout measures 7–18, articulation, spacing, dynamics, and other musical domains are closely coordinated with the intervallic successions and instrumental groupings. Let us look at measure 12 for a particularly intensive example of the coordination of articulation with intervallic structure. In this measure each instrument plays one of the intervallic patterns involving 3 and 4. Furthermore, six of the notes in this measure are played arco and six pizzicato. Within our familiar instrumental duets (first violin and viola; second violin and cello) let us see how the arco-pizzicato distinction helps organize the music.

<table>
<thead>
<tr>
<th></th>
<th>arco</th>
<th>pizz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violin 1: B♭</td>
<td>G♭, G</td>
<td></td>
</tr>
<tr>
<td>Violin 2: A</td>
<td>A♭, F</td>
<td></td>
</tr>
<tr>
<td>Viola: B, D</td>
<td>E♭</td>
<td></td>
</tr>
<tr>
<td>Cello: Db, C</td>
<td>E</td>
<td></td>
</tr>
</tbody>
</table>

Each instrument plays one or two notes arco and its remaining notes pizzicato. Not surprisingly, they do so in all four possible arrangements:

- Violin 1: pizz arco pizz
- Violin 2: pizz pizz arco
- Viola: pizz arco arco
- Cello: arco pizz arco

Notice also that in each of the pairs of instruments above, both the pizzicato notes and the arco notes (three of each) define one of the familiar three-note groups containing intervals 3 and 4. These intervals are not ordered into one of the four patterns, but they are present and audible nonetheless. In Sound Example 18, you will hear first the pizzicato notes, then the arco notes, then measure 12 as a whole.

Throughout measures 7–18, contrasts in mode of attack are used to articulate the musical structure. Usually normal legato bowing is contrasted with something else: staccato (as in measure 7), pizzicato (as in measure 12), tremolo, or sul ponticello. Sometimes this contrast is used to project an attack-defined grouping involving intervals 3 and 4. Other times, the attack-defined grouping suggests a
structure more characteristic of later parts of the piece. Consider, for example, the last six notes in the first violin in measures 15–18. Three of these are bowed normally and three are not (they are either sul ponticello or pizzicato). Each of these attack-defined three-note groups involves intervals 4 and 5, the very intervals to be intensively developed in the next section of the piece, beginning in measure 19. As one section comes to a close, and one aural path comes to an end, a new section and a new path open up.

Let us briefly retrace our path through measures 1–18, drawing together the principal threads we have followed. Amid the patterned variety of contours, spacings, and articulations in measures 1–6, we discerned first a preoccupation with ordered pitch class interval + 3 (measures 1–3) and then with − 4 (measures 4–6). Beneath this direct intervallic presentation we observed groupings, particularly those defined by dynamics and register, which suggested various ordered patterns of these two intervals. Then, in measures 7–18, we traced the intensive development of these suggested patterns, a development involving all aspects of the musical structure. Try to follow this path while you listen to Sound Example 19, a performance of the entire passage.

This kind of sectional organization—involving the presentation and subsequent development of an interval or pair of intervals—is employed throughout the entire quartet. The quartet alternates sections of intervallic presentation (in the modified unison texture of measures 1–6) with sections of development of the presented interval (usually in conjunction with one or more of the previously-presented intervals). In this way, each of the eleven ordered pitch-class intervals is presented and developed in turn. Finally, in a moment referred to by Babbitt as “telling you the butler did it,” we get a set of twelve pitch classes containing all eleven ordered pitch-class intervals in the order in which they occurred in the piece. We thus discover, by a process of “disambiguation” (Babbitt’s own term), the set which controls the entire musical structure.

Babbitt has attempted to solve the problem of contextuality—creating and apprehending musical coherence in the absence of communal norms for doing so—by insisting on the most thorough and intensive possible integration of all the musical domains. The result, in the case of the passage we have discussed, is a remarkable coherence and rich allusiveness. In such a passage, one can follow, as we have, a single path strewn with musical delights. Simultaneously, one becomes aware of other diverging paths, suggesting journeys to be taken through other parts of the larger edifice. Later, when we take these journeys, we may encounter reminders of that first path. We may never succeed in exploring the entire structure (or at least not as thoroughly as we would like), but even a single path may give a hint of the riches to be found there.

I would like to thank John Rahn, Robert Morris, Andrew Mead, and especially Joe Dubiel for their careful reading of this paper and their incisive criticisms.
NOTES


2. In many ways, my model for this approach is John Rahn’s analysis of Webern, Symphony op. 21 ( Thema) in Basic Atonal Theory (New York: Longman, 1980), 4–17. Like Rahn, I will assume no prior knowledge of either the particular piece at hand or of the twelve-tone system. My assumed audience, like his, is a class of advanced undergraduates. In fact, most of this analysis was originally presented in such a class.


4. Like any discussion of Babbitt’s Quartet No. 2, mine is indebted to Mark Zuckerman, “On Milton Babbitt’s String Quartet No. 2,” Perspectives of New Music 14, no. 2/15, no. 1 (1976): 85–110 and to the dissertation from which this article was derived, “Derivation as an Articulation of Set Structure: A Study of the First Ninety-Two Measures of Milton Babbitt’s String Quartet No. 2.” (Ph.D dissertation, Princeton University, 1976). Although my perspective is different and I follow a somewhat different path through the piece, some of the relationships I point out were already identified and elegantly discussed by Zuckerman. I will identify the most important of these where they occur. Because of the greater availability of the article, I will cite it in preference to the dissertation wherever possible.

5. The members of the Queens String Quartet are Sebu Sirinian and Lisa Tipton (violins), Deborah Judd Albert (viola), and Deborah Assael (cello). I am glad to thank them and David Barnes, the studio engineer, for their generous collaboration on this project.


9. Strictly speaking, some of these plus and minus signs are irrelevant because two simultaneous notes necessarily describe an unordered, not an ordered, interval. However, when it will cause no confusion, I will leave them in to emphasize the relationship between the vertical intervals and the numerous ordered intervals all around them.
10. The registral distribution in the second violin suggests the trichord [037], a set stated also by the conjunct trichords within each instrumental part in measures 1–3. See Zuckerman, “Derivation as an Articulation of Set Structure,” 48–50.


12. To maintain strict conformity with the scheme shown, the Ab in the second violin (measure 5) should be marked fff and the A in the second violin (measure 6) should be marked f. However, despite Zuckerman’s assertion to the contrary (“On Milton Babbitt’s String Quartet No. 2,” 89), the composer has assured me, in a private communication, that the dynamics are correctly marked in the score. Because both the Ab (measure 5) and the A (measure 6) are doubled by the cello at the “correct” dynamic level, it is not difficult to hear the passage in terms of the scheme shown. Babbitt appears to have departed from the scheme because of the difficulty the second violin would have in measure 6 in playing a pizzicato double stop at two different dynamic levels. Having thus marked the A in measure 6 fff, the Ab back in measure 5 is marked f to compensate. These two “incorrect” dynamics create additional relationships in the passage. Notice, for example, that the second violin notes marked f describe the interval succession −4, +5 while the fff notes in the second violin describe the succession +5, −4. These successions (along with −5, +4 and +4, −5) are precisely those developed in the subsequent section of the piece, beginning in measure 19.


14. In measure 17, the first note in the cello should be an E-natural, not an E-sharp as it is incorrectly shown in the published score.
