Takemitsu has described composition as "creating an environment where sounds may meet dramatically." Indeed, the sense of urgency felt at times is the result of dramatic rising and falling shapes in the parallel columns of sonority. The complexity of Takemitsu’s technique lies in the superimposition of different envelope shapes in different parameters, and often with contradictory tendencies. In November Steps Takemitsu demonstrates a refined, highly personal approach to musical pacing and structure which on the whole proceeds as if through composed sequence of short phrases. Long range relationships between phrases are not immediately apparent, but are to a degree clarified from the perspective of sonority.

It is not easy to isolate steady-state sonorities in November Steps. The music proceeds as a dovetail of chordal and textural events in different registers in continuous evolution. Sonorities reduced for purposes of analysis (figure 1) are abstracted from moments within a gesture when the most pitches have the greatest duration. As there is no accounting for all surface melodic events the present analysis enters at the moment of closure and background levels only. There are often up to four transformations in sonority within a given measure, and some measures are arbitrarily subdivided into a, b, c, and d. A second challenge lies in the area of phrase and subphrase division. Clearly, in music which under almost constant evolution and overlap of sonority, phrase divisions will be felt wherever there is silence or a caesura. In the passage in question, the sections of the music which extends from measure 36-48, the form divides into six clear phrases and at measures 37, 38, 40, 44 and 46.

Phrase divisions articulated by duration prompt two questions with respect to sonority. First, how might global changes in sonority reflect or depart from the quasi-symmetrical form outlined by duration? Second, is there a change in the treatment of sonority which enables a continuous musical flow through the long fourth phrase?
Figure 2. Phrase Divisions Based on Silence.

Upon consideration of movement in registral extremes (figure 3), the number of active timbres (figure 4), and the number of active registers (figure 5), the seventh section of November steps indeed appears to fit into a three-part ABA form with divisions at measure 40 and 44. There are only two moments with ext...
registral spreads, occurring at measures 37 and 47, and both events are approached by a rapid expansion of a narrow registral band. Measures 37 and 47 also both contain the highest values for the number of registral regions articulated by the sonority. In addition, extreme fluctuations in the number of active timbres are noticeable at the beginning and end of the section, though with somewhat less variety in the latter.

Figure 3. Movement of Registral Extremes

Figure 4. Number of active timbres.
There are specific timbres which tend be concentrated in the early and late stages of the movement, giving further support to a quasi-symmetrical structural interpretation. Harp occurs on four occasions in the first three and last three measures. (figure 6) The gongs are employed on only two occasions, in measures 43 and 45. 2 Woodwind figures occur on each side of the middle phrase, in measures 39-40 and measure 45, in the contrasting middle section.
There are two additional trends revealed in the use of timbre which are too subtle to act at the level of structure, but nonetheless help maintain freshness and buoyancy throughout and reflect conscious decisions by the composer. Both of these trends involve the string instruments. One is the gradual elimination of sonorities of more than one instrument type. Evident in figure 6, there is a high proportion of three and timbre string sonorities at the beginning of the movement but exclusively two and single timbre string sonorities at the end. From this perspective the entire movement might be heard as a process toward homogeneity within the string family. A second trend is the gradual decrease in the frequency of string sonorities, which occur almost in every consecutive sonority until measure 43, and tend to alternate sonorities after this point. Though the opening and closing phrases are the same in many respects, the timbral effect will be noticeably different.

Figure 6. Number of Instruments per family class
The most compelling registral feature of the movement is the consistently narrow registral movement between measures 40-44, corresponding to the fourth phrase or "B" section above. During the same period figure 4 reveals a pronounced flattening in the variety of timbres. Measures 41b - 43b are exclusively the strings, unlike the mixed brass and percussion sonorities of the outer sections.

As is often the case, freezing one or more parameters seems to permit more subtle manipulations of other parameters. Parallel registral movement for sonorities maintaining approximately the same registral span, together with relative homogeneity of timbre, enables an entirely different level of perceptual focus. Certainly one is more acutely aware of the pitch, and Takemitsu seems to take advantage of this with rapid and extreme fluctuations in pitch level. But it is the number of notes and the number of registers that emerge as functional parameters in the passage. Figure 5 reveals an oscillating pattern of change in parameters starting at the end of measure 39, which corresponds to a relatively static period in the number of timbres. (figure 4)

The pitch structure of chordal sonorities employed in November Steps suggest an integration of vocal based on register and density alone with somewhat more recognizable sonorities left over from tonal
There are four basic type of vertical pitch structures in the movement: 1) chromatic clusters, 2) diaton clusters, 3) quasi-triadic harmonies, and 4) simple, exposed two-note intervals. Notably, there appear no examples of "artificial intervallic constructs" of say, consecutive fourths, fifths and tritones, such as with Ligeti and Messiaen, anywhere in the movement. 3 Takemitsu, informed by the experience of tex compositions in the late 1950s and early 1960s, manages to synthesize movement in register and not with movement between recognizable sonorities and modes. While there are certainly no harmonic function in the traditional sense in the music, the listener may still perceive motion from, for example, triad based harmony to chromatic clusters, to diatonic. It is an elaboration of a concept first suggested in the piano preludes of Debussy sixty years earlier.

Takemitsu’s approach to pitch structure may be approached through analysis of the longer middle phrase. (figure 7) The construction and sequence of sonorities suggests a division into two subphrases, measure 40-42 and 43 through 44. Each of the two subphrases illustrates opening and closing envelopes terms of registral density, moving from chromatic sonorities to more spacious triadic sonorities, then returning to a chromatic sonority by way of an intervening diatonic spread. The second subphrase, perhaps an organic extension of the first, demonstrates two such opening and closing envelopes. 4 As the outer sections of the movement seem to focus upon outward expansion of registral extremes, the middle section works with the relative intervallic space between the inner voices. The main difference between Take approach to composition with registral space and textural composers such as Ligeti, Kotonski, and Penderecki is that Takemitsu finds a qualified, near tonal sonority to serve the same purpose. True, the instances of this in Ligeti, but there it is an affectation. Here the technique is used consistently as part of the main stream.
As mentioned at the outset, in November steps one often observes simultaneous layers of measurable phenomena in several parameters at the local level. A large quantity of information is condensed into a short time span. The number of parameters, the rate of change, and a tendency towards linear growth and decay as sudden shifts is a signature of the Takemitsu sound. Superimposition of contrasting envelopes of sound demonstrated in the short phrase first phrase starting in measure 36. It is divisible into a three stage envelope labelled 36a, 36b, and 36c, comprised of three different dynamic shapes in four parameters of sonority. Movement in registral extremes (figure 3) places the top and bottom voices in contrary motion, flaring from high to upper-mid and low registers. In contrast, a rising and falling "spike" pattern occurs in both parameters of number of active registral regions (figure 5), and the number of individual timbres (figure 6). The number of registers moves from three to five to two, while the number of timbres moves from one...
to two. As a third tendency, the total number of tones decreases from ten to nine to two.

Figure 8 Contrasting dynamic shapes in the first phrase.

<table>
<thead>
<tr>
<th>Contrary Motion</th>
<th>Rising and Falling</th>
<th>Decreasing Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>registral extremes</td>
<td>number of active registral regions</td>
<td>number of notes</td>
</tr>
<tr>
<td>registral extremes</td>
<td>number of timbres</td>
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The rapid transformation in the number of timbres bares closer inspection. From a timbral perspective, the phrase undergoes a transition from strings to brass, passing through a transitional mixed-family state, where string, brass, and harp and percussion are present. (Figure 6) It is a three stage timbral envelope which moves in parallel to the three stage transitions in registral extremes and number of notes.

The discussion thus far has focussed upon statistical differences and transitional states between phrases through analysis of sonority. The ultimate controlling variable in the passage, however, has nothing to do with sonority. The listener's ear is ultimately tuned to the slow passage of melody. More accurately, dignity and continuity are achieved through counterpoint between the highest and lowest notes of each sonority. Figure 9 is a reduction of the pitch extremes throughout the phrase while in figure 10 each pitch is traced within a single octave span in the mid register. The predominance in tied notes occurring in an almost unbroken chain in figure 10 illustrates the degree to which Takemitsu is dependent on registral transfer of specific pitch classes to achieve continuity through the movement. 5 Secondly, the most common absolute intervals between soprano and bass are thirds, sixths, and fifths, which are familiar as the basic consonant intervals employed in first species counterpoint. Though thoroughly disguised by registral transfer and other manipulations in sonority, this middle ground counterpoint gives the music a familiar quality and a very deep sense of logic and control.

Figure 9. Highest and lowest notes of sonorities.
A final comment concerns specific pitch structures of some of the basically triadic harmonies which occur in the passage. Figure 11 presents the sonorities occurring at measures 36b, 37, 42a, and 43b. As discussed earlier, Takemitsu moves through triadic sonorities as part of a process of registral spacing, permitting a clearer perception of inner voices. But it is in these triadic sonorities that his lingering affiliation with remnants of functional harmony are exposed. Allowing for a certain degree of arbitrariness, some chords may be associated as highly embellished functional harmonies. The chord in measure 36b may be thought of as a C altered dominant seventh. The sonority in measure 37 might be interpreted as a D7 chord in some inversion, as in a dominant pedal. The sonority in measure 42 is highly reminiscent of a G half diminished seventh, while the harmony of 43b could easily be interpreted as an F altered dominant seventh. What they all seem to have in common is that they are traditional "penultimate" harmonies containing at least one tritone. For ears educated in the western tradition such sonorities have strong connotations of unresolved tension. This may assist in generating forward momentum in music with an absence of rhythm.
Takemitsu's music is often characterized as a blend of Eastern and Western European aesthetics. The strongest Eastern adaptation, besides the use of traditional instruments, is the suppression or absence of "purpose." It is not goal oriented music in which some conflict must be resolved. Certainly the change in sonority and melody create a naturally dynamic music, with a tempo perhaps rooted in the ebb and flow of breath. But the ultimate effect is simply of sustained mood, a meditation. Takemitsu once said, "Sound can be beautiful without making sense. The quality of the music is thus elusive. One must absorb and accept, not necessarily understand." 6 Curiously, this type of statement could easily have come from Morton Feldman. Both use sonority as a means to a slower, deeper mode of listening. The single element which separates Takemitsu from all others in the post serial era is a return to and wholesale exploitation of rhythm. In this respect Takemitsu is solidly in a Western mode of thought. Specifically, melody which dominates chordal sonorities largely eminating from the Western tradition shows the direct influence of Messiaen, the difference is a much slower, suppressed approach to rhythm, and the incorporation of dynamic changes in timbre during the course of a melodic span, rather than in sequential or alternating gestures. The most remarkable feature of November Steps is that it achieves a subtle sense of tension and relaxation, a give and flow to and from points of articulation and phrasing even though pulse and rhythm are all but eliminated.

2. As an interesting twist, it is the inharmonic spectra which seems to be functioning as a "tonic" sound but one allows a traditional interpretation of a rounded binary form.

3. In an indirect way this reveals the continuing influence of traditional functional harmonies on Takemitsu's music, however watered down or disguised they may be.

4. If one were further to apply the concept of critical bandwidth to the section, movement from chromatic to quasi triadic sonorities results in the perception of independent inner voices instead of a totality, a move from monophony to polyphony. One is likely also to perceive the triadic sonorities as louder than the chromatic sonorities.

5. From this point of view Takemitsu is perhaps not as far removed from Morton Feldman's.