

# Metric Modulation and Elliott Carter's *First String Quartet*

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The elevation of rhythm from a position of secondary to primary structural importance is a major contribution of much twentieth-century music. Although it is often not very well understood, one of the better known techniques to have emerged in the area of rhythm is metric modulation, a device perhaps traceable to several composers, but whose full structural and expressive potential was first tapped by Elliott Carter in his First String Quartet (1951). In this study, we shall examine several examples of metric modulation taken from the work. A discussion of how the process fits into the overall structure of the quartet follows.

## Definition and Single-line Examples

Metric modulation, briefly defined, is a precise and controlled method of proceeding from one metronomic speed to another. Example 1a demonstrates the stretching of the metric referential from a quarter note or 4 X 16th-note equivalent in  $\frac{2}{4}$  meter to a 5 X 16th-note equivalent in  $\frac{10}{15}$  meter. The latter value subsequently becomes the norm of the new quarter note whose length, in effect, is greater than the original quarter note by a ratio of 5:4. The metronomic speed, exhibiting the same ratio, thus "ritards" from  $\text{♩} = 80$  to  $\text{♩} = 64$  (the greater the pulse value, the lower the metronome marking—and so the inverse relationship of 4/5 with 80/64).

## INDIANA THEORY REVIEW

Example 1. Slowing the Pulse.

a. Rhythm of vln. I, mvt. III, mm. 25-31.

The score consists of two systems of music. The first system, measures 25-28, starts at  $\text{J} = 80$  in 2/4 time. It features sixteenth-note patterns with a fermata over the last note of measure 25. Measures 26 and 27 show eighth-note patterns. Measure 28 begins at  $\text{J} = 64$  in 2/4 time, continuing the eighth-note pattern. The second system, measures 29-31, starts at  $\text{J} = 80$  in 2/4 time with eighth-note patterns. Measures 30 and 31 show sixteenth-note patterns.

b. Basic modulation process.

A diagram illustrating a basic modulation process. It shows a vertical line with two sections above it. The left section is labeled  $\text{J} = 80$  and 4. The right section is labeled  $\text{J} = 64$ . Between the sections is a bracket containing a measure of music with a fermata over the second note. To the right of the bracket is an equals sign followed by another measure of music without a fermata.

- c. Notation needed to obtain the rhythmic durations of mm. 29-31 in the original tempo.

Handwritten musical score page 2. The top left corner shows the tempo: ♩ = 640 (♩ = 80). The score consists of three measures separated by vertical bar lines. Measure 29 (measures 1-4) starts with a 20/32 time signature and a (5+5+5+5) grouping. Measure 30 (measures 5-8) starts with a 16/16 time signature. Measure 31 (measures 9-12) starts with a 16/16 time signature.

unit is shortened. Quintuplet 16th notes first become straight 16ths, which are then re-notated as eighth notes. As a result of these adjustments, the new quarter note has shrunk to 2/5ths of its original value, and thus the accelerando metronomically from  $\text{♩} = 64$  to  $\text{♩} = 160$  (the shorter the pulse value, the higher the metronome marking—and so, again, the inverse relationship, this time 5/2 with 64/160). As with the earlier example, transposition of the new rhythmic durations into the old tempo proves difficult and impractical.

## Polyphonic Examples of Metric Modulation

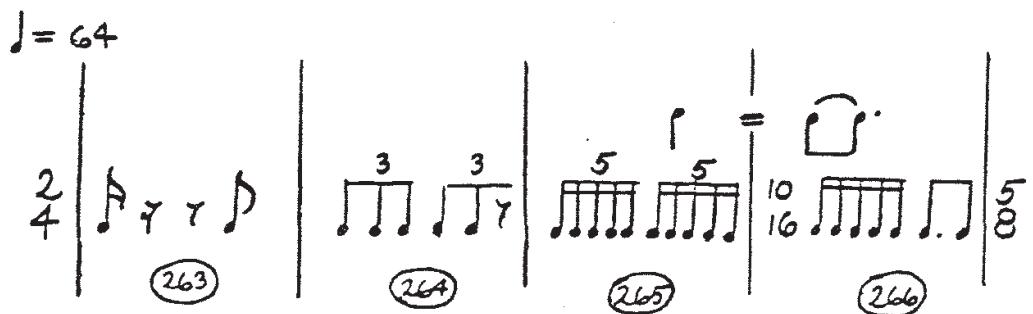
Metric modulations often involve two or more lines of music, an aspect of the technique which is revealed in one of the composer's own descriptions: "Say, one part in triplets will enter against another part in quintuplets and the quintuplets fade into the background and the triplets establish a new speed . . ." (each new speed may then function as a springboard for another such operation).<sup>1</sup> Carter might very well have been alluding to the passage shown in Example 3.

The quintuplets and triplets are, of course, found in the second and first violins respectively: quintuplet-eighths within  $\frac{2}{4}$  meter,  $\text{♩} = 60$ ; triplet eighths within a superimposed  $\frac{5}{4}$  meter,  $\text{♩} = 180$  (which then become straight eighths in  $\frac{12}{8}$  meter,  $\text{♩} = 180$ ). The 5:9 ratio of characteristic eighth-note motion and 2:3 ratio of quarter-note motion form strong bases of conflict. These incompatible frameworks vie

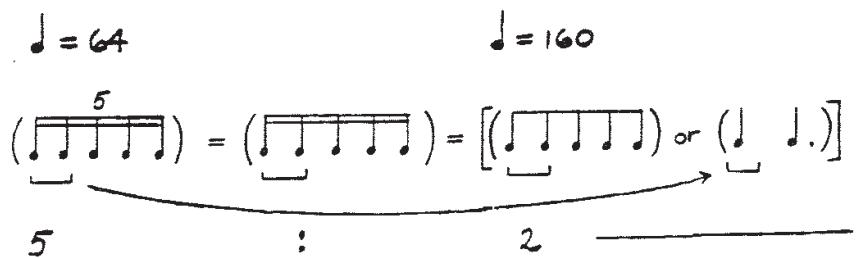
<sup>1</sup>Elliot Carter, "Shoptalk by an American Composer," Musical Quarterly 46 (1960):266-67.

Example 2. Speeding the Pulse.

a. Rhythm of vln. I, mvt. I, mm. 263-272.



b. Basic modulation process.



## METRIC MODULATION

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Example 3. Metric Modulation Accomplished  
Polyphonically in Two Parts,  
Mvt. I, mm. 49-57.

The image displays three staves of musical notation, likely from a score, illustrating metric modulation. The notation is in common time throughout. The first staff begins with a tempo of  $(d = 60)$ . The second staff begins with a tempo of  $(d = 180)$ . The third staff begins with a tempo of  $(d = 60)$  and ends with a tempo of  $(d = 180)$ . Measure numbers 49, 50, and 51 are indicated above the staves. The music consists of six measures per staff. The notation includes various note heads, stems, and rests, with some notes having horizontal dashes through them. Measure 50 shows a dynamic marking  $p$  (pianissimo) and  $mf$  (mezzo-forte). Measure 51 shows a dynamic marking  $mf$  (mezzo-forte) followed by  $cresc.$  (crescendo).

for dominance, with the two parts acting out a kind of mini-drama. After a brief "struggle," the quintuplets fade and the second violin ultimately assimilates the eighth-note speed of the first violin. (The lower parts, moving evenly beneath, provide a metric point of reference for both upper parts, and thus function as a sort of common denominator.) The example illustrates perfectly Carter's extension (or elevation) of the principles of counterpoint from a simply rhythmic level to a metric level.

A metric modulation involving three parts is shown in Example 4. In this passage, a modulation from  $\text{J} = 100$  to  $\text{J} = 140$  is accomplished through overlapping entries of progressively faster rhythms, and the usual types of value equations. The effect is not so much a "tug of war" (as in

**Example 4. Metric Modulation in Three Parts.**

The musical score illustrates a metric modulation between three parts: vln. I, vla., and vcl. The modulation occurs over 11 bars, indicated by the bar numbers 180 through 193 at the bottom. A curved arrow at the top shows the transition from  $\text{J} = 100$  to  $\text{J} = 140$ . The vln. I part starts with a eighth-note followed by a sixteenth-note. The vla. part enters with a sixteenth-note followed by a eighth-note. The vcl. part enters with a sixteenth-note followed by a eighth-note. The score shows various rhythmic patterns and value equations, such as  $(\frac{7}{16}) = (\frac{5}{8})$  and  $\text{J} = \text{J}$ , indicating the equivalence of different note values across the different parts and rhythms.

the previous example) as it is reminiscent of a footrace in which runners, though competing, still agree as to the direction in which they are headed.

**Metric Modulation and the Larger Design**

The discussion thus far has focused on separate and isolated examples of metric modulation, and has demonstrated the technique as it operates on the micro-structural levels. Metric modulation also plays a significant role in shaping and molding the work's larger design or macro-structure.

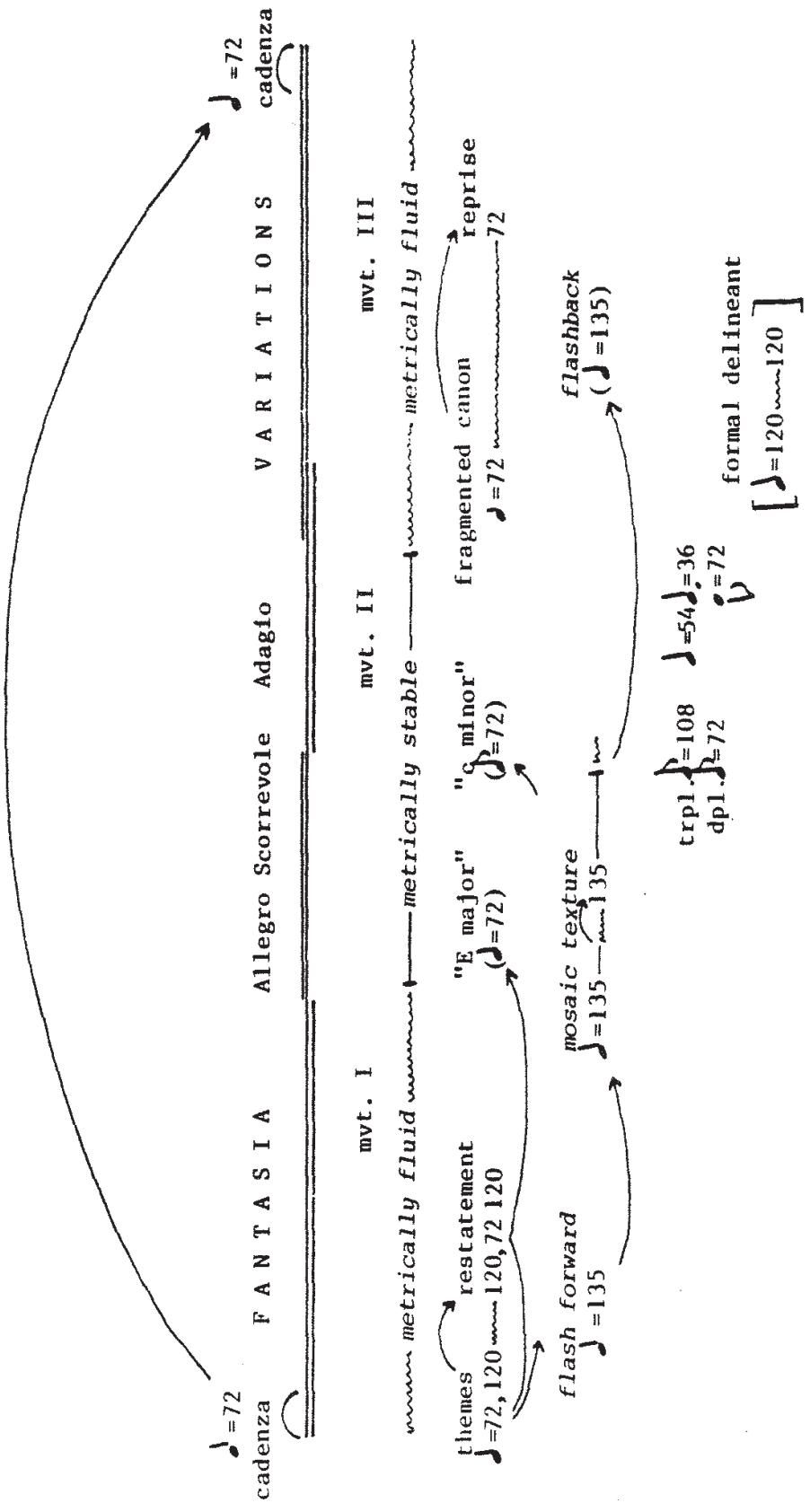
A visual representation of the quartet's overall form showing its underlying structure of tempos is shown in Example 5. Various departure and return gestures, ranging from recapitulations within sections to the reprise of the coda at the work's conclusion, can be seen to be supported by an analogous tempo scheme. Recurring harmonic and textural relationships also are reinforced through associations with tempo. And in the Variations, tempo ( $\text{♩} = 120$ ) functions as a formal delineator, marking the beginning and end of a large unified structural block of 138 measures. Overall, the work's metronomic center is M.M. 42, which serves as the primary referent throughout.

The use and non-use of metric modulation are fundamental to Carter's overall structure of the work as well. The middle portion of the work, without metric modulation, assumes a more stable sense of pulse that contrasts with the metric fluidity of the outer portions.

In summary, the technique of metric modulation serves the following musical purposes in Carter's First String Quartet:

- 1) Metric modulation is a controlled method of speeding or slowing the pulse, thus rendering the beat supple and elastic.
- 2) By diversifying metronomic speeds, metric modulation opens up a variety and range of durational values that are either very difficult (see Example 1c) or impossible to exploit in a fixed tempo, and thus makes for a more "chromatic" rhythmic palette.
- 3) Metric modulation, when used polyphonically, provides a basis for counterpoint in a more extended sense, allowing individual parts to move with greater independence and in greater contrast to one another.
- 4) The use and non-use of the technique contribute importantly to the work's overall formal definition.
- 5) Metric modulation makes possible the departure and return of tempos, which constitute an essential and integral part of the work's design (analogous, in this respect, to the modulation of keys in tonal music).

Example 5. Overall Form of Carter's First String Quartet



Example 6. Fluctuations of Quarter-Note Speed in the Fantasia.

