

Steve Reich's Phases of Phases:

A Comparison of *Electric Counterpoint* and *Radio Rewrite*

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Introduction.

Minimalism developed primarily during the 1950s, 60s, and 70s amidst a rising counterculture in America. Minimalist artists in the 50s defied expectations of what “art” should be; one example is the color fields of artists such as Ad Reinhardt.¹ Minimalist artists focused on the very deliberate creation of works that were comprised of the smallest amount of discernible qualities; with the aforementioned color fields, the viewer was intended to observe the minutiae of the brush strokes of the artist.² In the mid-60s, minimalist music also started to take hold, driven by the efforts of composers Terry Riley, La Monte Young, Philip Glass, and Steve Reich.³

Reich is well-known for pioneering *process-based music*, as established in his 1968 essay “Music as a Gradual Process.”⁴ Process-based music is characterized by its minimal amount of material, with development (a *musical process*) occurring through changes in the material over a period of time.⁵ Reich’s most prominent type of process is phase shifting, which involves “placing a simple repeating pattern in different combinations with itself.”⁶ Due to the very nature of process-based composition, Reich’s music has a “structurally lucid aesthetic,” as the material

¹ Jonathan W. Bernard, “The Minimalist Aesthetic in the Plastic Arts and in Music,” *Perspectives of New Music* 31.1 (1993): 94. Web.

² *Ibid*, 95.

³ *Ibid*, 86.

⁴ Steve Reich and Paul Hillier, ed., “Music as a Gradual Process,” *Writings about Music, 1965–2000*, Oxford and New York: Oxford University Press, 9–11.

⁵ Auner, Joseph. *Music in the Twentieth and Twenty-First Centuries*. New York: W. W. Norton, 2013, 284.

⁶ Auner, 284.

and form of the music is as apparent to the listener as it is to the composer.⁷ Moreover, Reich explicitly composed to be understood, as he “believe[d] that music does not exist in a vacuum,” relying on feedback from “the popular, naïve reaction.”⁸ The subtle -- yet easily observable -- evolution of pared-down music material is akin to a time-based form of minimalist visual art: the musical processes of Reich are to a piece of minimalist music what the brush strokes of Reinhardt are to a piece of minimalist visual art.

To explore some of Reich’s aesthetics, this paper examines two pieces from Reich: *Electric Counterpoint* (1987), movement “III: Fast” and *Radio Rewrite* (2012), movement “V: Fast.”⁹ Many qualities of the two pieces are similar. In both *Electric Counterpoint* and *Radio Rewrite*, there are very few distinct types of material; each piece material is often limited in some way to increase its recognizability. To develop the material, Reich employs phase shifting, superposition, and modulations; through these processes, Reich creates structure in his pieces. The differences between the two pieces come in their differing emphasis on harmony and melody. *Radio Rewrite*, based on the alternative rock band Radiohead’s music, also features a more traditional and directed approach to melody and harmony than *Electric Counterpoint*.¹⁰ Overall, *Radio Rewrite* is, in some sense, an extension of the work done in *Electric Counterpoint*, as it showcases Reich’s hallmark musical processes incorporated with popular harmonic and melodic sensibilities.

⁷ Quote from: K. Robert Schwarz, “Steve Reich: Music as a Gradual Process: Part I,” *Perspectives of New Music* 19.1/2 (1980): 375.
Auner, 284.

⁸ Reich, as quoted in Schwarz, 375.

⁹ Rehearsal numbers for *Electric Counterpoint* from the following score: Steve Reich, *Electric Counterpoint*, New York: Hendon Music | Boosey & Hawkes, 1987.

Bar numbers for *Radio Rewrite* from the following score: Steve Reich, *Radio Rewrite*, Milwaukee: Hendon Music | Boosey & Hawkes, 2012.

¹⁰ Reich’s “Note by the composer” in the score for *Radio Rewrite*.

Base material.

Each piece has its own set of foundational motifs, melodic ideas, and chords upon which Reich performs his compositional processes. Examples of each type of material from each piece are shown on page 5. *Electric Counterpoint* mvmt III (henceforth referred to as EC) is comprised of three sections of material: a repeating, melody-like motif, a bass line, and some chord progressions. *Radio Rewrite* mvmt V (henceforth referred to as RR) is comprised of five different types of material: a piano/electric bass rhythm section, a fast melody played by vibraphone and violins, a second fast melody played by vibraphone, violins, and clarinet; chords played by string quartet; and a slow melody played by viola and cello.

The aforementioned material has qualities that make it suitable to undergoing musical processing: the material is often limited in duration and/or pitch content, and have characteristic rhythmic and intervallic patterns. The main melodic motif of EC is only a bar long, and has a distinctive descending then ascending shape as well as an interesting rhythmic signature. RR's two melodies are longer (4 bars), with more traditional phrasing. The longer length is compensated by a small pitch content, with the first melody having 4 main pitches and the second having only three.¹¹

Despite being a shorter piece in length, RR has more diversity in its original material than EC; RR has five pieces of distinct material while EC has only three. Greater diversity is also evident from the orchestration of RR compared to EC's. The thickness of the chords in the piano's material at measure 692 lend a heaviness to the piece. The several different timbres expressed by the strings (short and intense as in the first melody versus long and smooth as in the chords and slow melody) show RR's greater reliance on timbral qualities to differentiate

¹¹ The example on page 5 shows the third doubling; the thirds are not being counted in the amount of pitches that the melody has.

material, as compared to EC, where only two pieces of material are played on the same set of instruments. This difference may be due to the numerous fairly distinctive timbres featured in “Jigsaw Falling into Place”, the song RR was based on.¹²

The degree to which the pieces rely on differing timbres and other qualities to set the pieces of material apart is carefully controlled by performance markings in the text and directions in the performance notes. For instance, in RR’s performance note Reich notes that the electric bass “should never be too loud” as it may “make the piece ‘over weight’ and sluggish” if it stood out too prominently.¹³ In EC’s performance note, the method of live guitar amplification is dictated, as well as the balance.¹⁴ The use of pre-recorded tape guitars, in EC’s case, allows for precise control of certain qualities of sound such as dynamics. The fine-grained dictation of the overall aesthetics of the pieces, combined with the notable qualities of the base material allows for easier exposure of Reich’s musical processes to the listener.

¹² Radiohead, perf., “Jigsaw Falling Into Place,” *In Rainbows*, TBD Records, 2008, MP3.

Reich, “Note by the composer” in *Radio Rewrite*.

¹³ Reich, “Performance notes” in *Radio Rewrite*.

¹⁴ Reich, “Notes on Performance” in *Electric Counterpoint*.

Electric Counterpoint's base material¹⁵

♩=192 original (70-71)

Top: Main guitar melody/motif, played in various permutations by the first four guitars. *Bottom left:* Bassline, spread across the two bass guitars. *Bottom right:* chords, played by bottom three guitars. Numbers in parentheses indicate rehearsal numbers.

Radio Rewrite's base material¹⁶

♩=178 Piano material (692)

Top: Piano background material. Bass guitar doubles the bottom line.

Second row: First melody that appears in vibraphones and violins.

Third row: Second melody, in vibraphones, violins, and clarinet.

Fourth row, left: Example of a chord played by the strings, which last 8 or 12 bars.

Fourth row, right: Slow 12-bar melody played by viola and cello.

¹⁵ Audio examples (for all examples in this paper) can be found at:

<https://www.noteflight.com/scores/view/c95593241b44753bf6778a2dbbf3e9e8332edc22>

¹⁶ Audio examples:

<https://www.noteflight.com/scores/view/9c4561dab29a60d50b96a2e85894d01219370cfe>

Phase shifting.

Phase shifting is Reich's most famous musical process. Complex patterns and textures can emerge from the process of time-shifting a motif on top of a copy of itself. Reich explores this technique to a great extent within EC, and to a lesser degree within RR. In EC, phase shifting is used in a gradually-building manner to create a fabric of sound. In RR, phase shifting is used to destabilize the rhythm of the piece. Musical examples are shown on page 9.

The primary use of phase-shifting in EC is in the main guitar motif. There are three different phase shifted versions of the guitar motif heard in addition to the original motif. These are introduced one-by-one by the live guitar. They do not appear whole; rather, they appear in chunks. For instance, the introduction of the delayed-by-2-eighths motif is stretched over four measures, with the last part of the phrase being heard first, then the middle and the last part, and finally the whole bar; this process is repeated with each differently-phased motif. When the motif is fully realized, it is "passed" from the live guitar to one of the tape guitars, and the live guitar fades out over two bars. This process of building using blocks of differently-phased motifs gives an impression of a slow and deliberate broadening of the sound, allowing the listener to fully register each new phase-shifted motif as a distinct entity in and of itself before it is added to the collective of sound.

In RR, phase shifting is mainly employed to destabilize the rhythm of the piano material. The original material is already fairly hard to follow rhythmically, and lacks a steady beat due to heavy syncopation. When the second piano part comes in, the sound becomes staggered, as the second piano is only offset by an eighth note. A secondary effect of the phase shifting is a thickening of the harmony, due to the doubling of the tight note clusters in the right hand. As

noted earlier, the use of phase shifting in RR is noticeably less than in EC; it is used as a way to enhance the sound of the piano rather than a systematic way to build up the piece.

Superposition.

Superposition of lines, for instance of phase-shifted motifs or two variants on a motif, is also a key process employed in the two pieces. Superposition in the musical sense refers to the effect of the combination of two or more musical lines. In EC, for instance, the superposition of the two bass guitar lines results in a “predominately heard” line. In RR, superposition is used in a limited fashion to change the qualities of lines. Superposition can also be used to analyze two variants of motifs, allowing a listener to hear the subtle differences between them. Musical examples are shown on page 9.

EC uses superposition to bring out textures and timbres from the underlying base material; the primary use of superposition in EC is in conjunction with the phase-shifted motifs. When the collection of motifs are heard as a unit, a melodic reduction or equivalent melody can be heard from the combination of motifs. One is apparent from just the combination of the original and delayed-by-2-motif, as shown on the figure on page 9. As more phase-shifted motifs are added, the melodic reduction changes, as shown in the next bar. Reich’s intention for this sort of melody to “pop” out at the listener is shown at rehearsal 74, when the live guitar plays a similar line to the “heard” reduction shown in the given example for rehearsals 72-73.

Superposition is also used later in EC to establish a sense of rhythm, and create a sense of large-scale harmony. While bass guitar 1 and 2 are playing two distinct lines, they are quite similar. The doubling of certain notes in the parts causes a clear “in 3” meter to arise. The harmonic use of superposition is the superposition of the chords at rehearsal 87. Although there

are several chords being played at once, the combination of them creates an effective chord progression of IV - iii⁷ - vi⁹.

The superposition process is used somewhat in RR. For instance, an emerging harmony can be heard from notes that are emphasized from the piano note clusters through doubling, as shown in the examples. Another effect of superposition is the change in period of the piano background when the second phase-shifted part is added; the phrase length goes from 2 bars to 4 bars. Although superposition is less important from the listener's standpoint in RR than in EC, superposition of lines can be used in analysis to understand how material changes throughout the piece. One example depicting the main melody is shown on page 9. Instead of phase-shifting being the main process used for musical modification, slight changes in the rhythm and note order are made to the melody, leading to a recognizable melody with a subtly different quality. As the piece goes on, more slight changes are added with every reoccurrence of the same melody. The precise differences between the original and the changed melodies are hard to grasp without using superposition analysis.

The combination of phase-shifting and superposition are key processes to both EC and RR, although they are used more liberally in EC. This difference in usage suggests a change in approach to musical processes for RR from EC; for RR, phase-shifting and superposition are just one of the many possibilities for processes, rather than the most important or innovative of processes (as was the case for EC).

Electric Counterpoint: Phase shifting and superposition examples

The score consists of several parts:

- Top staff:** Three guitar motifs. The first is labeled 'original (70-71)' with rehearsal number 192. The second is 'delay 6 (72-73)'. The third is 'Reich's reduction (74)'.
- Middle staff:** A piano part with two staves. The top staff has 'delay 2' and 'advance 6' markings. The bottom staff has 'heard' markings.
- Bottom left:** A bass line with two staves labeled 'bass 1' and 'bass 2'. A note above the first bar is labeled 'emphasized notes (77) - in 3'.
- Bottom right:** A 'chord reduction' showing three chords: IV, iii7, and VI79.

Top, first two bars: Four different versions of the guitar motif, and “equivalent melody” that emerges as a result of superposition during the rehearsal numbers indicated. *Last bar:* Reich’s “intended” result of superposition in the live guitar in rehearsal 74.

Bottom left: Emphasized bass line arising from superposition of two bass lines.

Bottom right: Effective chord progression from chords at 87.

Radio Rewrite: Phase shifting and superposition examples

The score consists of several parts:

- Top staff:** Piano 1 and 2 (696) with a complex rhythmic pattern.
- Middle:** A series of six chords with rehearsal numbers: (692), (696), (700), (704), (712), and (716).
- Bottom:** Two piano staves. The top staff is 'First melody (728)' and the bottom staff is 'First melody var. (744)'. They show differences in the last beat of the 2nd and 4th bars.

Top: Result from phase shifting and superposition of the two piano lines.

Middle: Snippet of harmony arising from lines.¹⁷

Bottom: Original melody and variant; differences are in the last beat of the 2nd and 4th bars.

¹⁷ The author did not have time to do a full harmonic analysis.

Modulation.

The final type of process that is employed in EC and RR is modulation. In EC, both key and rhythm modulation feature heavily in the second half of the piece, contrasting it from the rhythmically and harmonically static first half. In RR, key modulation is used to develop base material and drive the piece; at the end of RR, a slowdown of the tempo establishes a sense of finality. Examples are shown on page 12.

The end of the first half of EC and beginning of the second is marked by a sudden modulation from G major to Eb major. In the score, most of the material remains the same, with only a few note changes in the guitar motif and some different chords. The bassline also changes from A-C-E to Ab-Bb-C. An interesting effect is that while the harmonic function of the chords used change between the G major and Eb major section, the overall sense of the sound (such as timbre and dissonance level) remain much the same to the ear. After eight bars in Eb major, the piece modulates again to G major; the key of the piece switches periodically as shown in the table on page 14. The cyclic nature of the modulation emphasizes its function as a process undertaken on the material. Rhythmic modulation is similarly cyclic and structural in the second half of EC. At 91, for instance, the meter in the chords and bassline switches to 12/8 while the guitar motifs stay in 3/2. The rhythm of the chords and bassline also switch so that they are in four, with the guitar motifs left unchanging in six. This creates a six-over-four feeling -- a hemiola -- between the guitar motifs and the bassline/chords. When the meter switches back to 3/2, the bass is no longer in three as it was prior to the rhythmic modulation, but in six, further emphasizing the six vs. four relationship. The meter changes periodically, like the key, as shown in the structural table. Even when the chords eventually drop out at rehearsal 103, the six vs. four

shifting is implied to keep going, as the meter changes from 3/2 to 12/8 every four bars, and the live guitar line changes a bit to feel very slightly more in four than in six.

In RR, sudden modulation is used to develop the material. Unlike in EC, the modulation is not in the key signature but just in what the prominent chord is; it does not feel like a functional harmonic progression due to its abrupt nature. Another aspect of the modulation in RR that is unlike EC is its aperiodic quality. The chords may change in four or eight bars; this aperiodic nature destabilizes the motion of the piece, akin to how phase shifting was used earlier in RR. Tempo modulation is used at the very end of the piece; the speed immediately and tremendously slows down at measure 768. Starting at 770 the meter switches back and forth between 3/2 and 2/2, giving the end an off-kilter feeling to match with the earlier destabilized sound of the piece. The effect of the tempo and meter modulation, together with the full and rich orchestration, gives a weighty sense of finality to the last 12 bars of the piece.

The function of modulation in EC and RR is the most similar across the two pieces. Key, rhythm, meter, and tempo modulation feature heavily in changing the characteristic sound and periodicity of each piece.

Electric Counterpoint: modulation examples.

Top: Change of chords; G major shown on left, Eb major shown on right.

Second row: Rhythm comparison between chords in six and in four.

Third row: Rhythm comparison of the different types of bass lines - in three, in four, and in six.

Fourth row: Comparison of live guitar line changes from 3/2 to 12/8 at the end.

Radio Rewrite: modulation example.

The dominant harmonic progression heard.

Overall structure of pieces.

The processes described above not only inform the local structure of the pieces, but give them an overall structure; in EC's case, the processes dictate the form much more strongly as compared to RR. See page 14 for a table summary of EC and page 15 for a table summary of RR.

EC is fairly modular in form, as the set of processes occurring at the different sections of the piece are distinct. The first half of EC focuses on the effects of phase shifting and superposition, while the second half of EC has only rhythm and key modulation. The subsections in the first half of the piece are distinguished by which new type of material is being added. In the last half of the piece, within each subsection there is a very regular change in key and rhythm. The difference in the rate of change marks the two subsections.

The overall form of RR is less determined by the processes used to develop the material and more by when particular material is being used. The first half of the piece is focused more on texture and harmony, as during this section phase-shifting and superposition is heavily used in the piano part. The last half of the piece is driven more by the presence of the melodies; while they are being audibly changed from appearance to appearance, the process of their change does not govern the structure of the second section as much. This melodic focus may be due to the source material ("Jigsaw Falling into Place"), as its structure is very similar: the song starts with a harmonic chord progression, then introduces a vocal melody which is similar in nature to RR's primary melody. Thus, in EC's case we see a process-driven form, while in RR's case we see a harmony/melodic-driven form.

Electric Counterpoint structural table: first half

(M: main guitar motif, number is amount of eighth notes, C: chords, B: bass line, G#: guitar #, BG#: bass guitar #)

R#	Subsection	Live guitar material	G material	BG material		
70	I:	M delay 2	G1: M delay 0			
71	Phase shifts of guitar motif	M delay 6	G2: M delay 2			
72			G3: M delay 10			
73			G4: M delay 6			
74			M reduction			
75	II:				BG1,2: bass line	
76	Bass focus					
77						
78						III:
79	Addition of chord combinations					C1: IV - iii - vi
80				C2: IV - V - vi		G6: C2
81						
82				C3: IV - V - iii		G7: C3
83						
84						
85		M reduction	dim. chords			
86						
87						
88						

Electric Counterpoint structural table: second half

(in the rhythm column: 6 = in six; 6/4 = hemiola (six over four); 4 = in four)

R#	Subsection	Key	Rhythm	Notes
89	I:	EbM	6	
90	Periodic development through key and rhythm modulation		6	
91		GM	6/4	
92			6	
93		EbM	6/4	
94			6	
95		GM	6/4	
96			6	
97		EbM	6	
98			6/4	
99		GM	6	
100			6/4	chords/bass start dim.
101		EbM	6	
102			6/4	
103		II:	GM	6
104	Ending	EbM	4	live guitar motif changes to emphasize in 4 vs in 6
105		GM	6	
106		EbM	6	
107		GM	4	
108		EbM	4	
109		GM	6	
110			4	
111		Em	4	implied E minor due to repeated high E

Radio Rewrite structural table

(colored boxes mark the appearance of important melodic/harmonic aspects of the piece)

M#	Subsection	Harmony change	Both piano parts	String chords	Melody 1	Melody 2	Slow melody	
692	I: Harmonic develop.							
696								
700								
704								
708								
712								
716								
720								
724								
728	II: Melodic develop.							
732								
736								
740								
744								
748								
752								
756								
760								
764								
768	III: Chord ending	<i>N/A</i>						
772								
776								

Conclusion.

Steve Reich, one of the founders of minimalist music, pioneered the development of process-based music: music that revolves around changes to a minimal amount of source material, focusing the listener's perception on details in the pieces. In *Electric Counterpoint* movement "III: Fast" and *Radio Rewrite* movement "V: Fast", the processes of phase shifting, superposition, and modulation were used to develop core chunks of musical material into full pieces. The pieces differed mainly in how much processes were the focus of each piece. In *Electric Counterpoint*, processes both served to transform the material and give the material an overall structure. In *Radio Rewrite*, processes mainly served as a development tool; overall structure was governed by which types of material (harmonic vs. melodic) were present. "My work [...] comes as a breath of fresh air to the new music world," wrote Reich.¹⁸ In *Electric Counterpoint*, his earlier work, he features the processes he pioneered, while in *Radio Rewrite*, his most recent work, Reich combines those processes and a popular music inspiration in a cohesive fashion, demonstrating his flexibility as a composer.

¹⁸ Reich, as quoted in Schwarz, 375.

Bibliography

- Alarm Will Sound, perf. Cond. Alan Pierson. By Steve Reich. *Radio Rewrite*. Avatar Studios. Nonesuch Records, 2013. MP3.
- Auner, Joseph. *Music in the Twentieth and Twenty-First Centuries*. New York: W. W. Norton, 2013.
- Bernard, Jonathan W. "The Minimalist Aesthetic in the Plastic Arts and in Music". *Perspectives of New Music* 31.1 (1993): 86–132. Web.
- Greenwood, Jonny, perf. By Steve Reich. *Electric Counterpoint*. Abbey Road Studios. Nonesuch Records, 1987. MP3.
- Paul Griffiths. "Reich, Steve." *Grove Music Online. Oxford Music Online*. Oxford University Press. Web. 12 May. 2016.
- Radiohead, perf. "Jigsaw Falling Into Place." *In Rainbows*. TBD Records, 2008. MP3.
- Reich, Steve. *Electric Counterpoint*. New York: Hendon Music | Boosey & Hawkes, 1987.
- Reich, Steve. *Radio Rewrite*. Milwaukee: Hendon Music | Boosey & Hawkes, 2012.
- Reich, Steve and Paul Hillier, ed. "Music as a Gradual Process." *Writings about Music, 1965–2000*. Oxford and New York: Oxford University Press, 9–11.
- Schwarz, K. Robert. "Steve Reich: Music as a Gradual Process: Part I". *Perspectives of New Music* 19.1/2 (1980): 373–392. Web.

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