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Steve Reich's „Piano Phase“ in Global Perspective: Myths & Realities

1. Introduction: Minimalism and its Methodological Occlusions

Minimal music was derived ... from Minimal Art, with which it shares numerous aesthetic and technical characteristics. (Dean Paul Suzuki)¹

In 1967, an American composer by the name of Stephen Michael Reich crafted a pithy work for two pianos entitled *Piano Phase*. The piece drew on an African musical form from pre-independence Uganda. In the art galleries of New York, where the work received its first set of performances, however, it served a specific and limited purpose: to provide fresh sonic impetus to a growing movement in the visual arts known as Minimalism. The artists involved in this movement — Sol LeWitt, Bruce Nauman, Richard Serra, Michael Snow, among others — showed little awareness or interest in the distant origination of Reich's peculiar sound; an awareness or interest that would do little to underscore the central stylistic tenets that characterized Minimalism at the time. Interest in foreign origins waned further when this body of largely visual works was analyzed, engaged with, and commented upon by critics, historians, artists and musicologists — who tacitly coalesced around a local American set of terms for how this new movement in the arts should come to be represented. Key ideas included severity of means, clarity of form, simplicity of structure and texture, a minimum of compositional manipulation, non-narrative structures, impersonality of tone, the release from transcendental allusion or humanistic value, and the rejection of abundance, opulence and detail. The works themselves were characterized by gridded patterns, repeated modules, held harmonies, impersonal processes, deconstructed (or canceled) figure-ground illusions, and the flattening of perspective. For the next half century — until the digitally-networked post-Cold War period ushered in a series of new global alliances and information flows — these *topoi* for grasping an artistic style had hardened into an injunction.

If African culture was never claimed as a constitutive feature of Reich's Minimalism, even less did it — as did the Afrocentric aesthetics of contemporary

American black musicians (Sun Ra, Herbie Hancock, George Clinton, and others) — aspire to forge non-Western alliances to re-examine racialized pasts and struggle for utopic futures. In fact, until the end of the Cold War, African cultural ideas not only remained a distant afterthought, or supplement to, the historical and critical reception of Minimalism but took no part in the great debate — inaugurated so dramatically by Barbara Rose, Michael Fried, Richard Wollheim, Tom Johnson, Susan Sontag and Michael Nyman in the 1960s and conducted thereafter on two continents and in many languages — about the intersections of art with interpretation, on the one hand, and perception, on the other. Instead, the *topos* of Minimalism, regarded as an enclosed artistic world entire to itself, drew its power from a confluence of circumstances — institutional, personal, and philosophical — none of which would open up for a rival African interpretation.

In the 1960s, for example, Reich and Philip Glass shared exhibition spaces with the visual artists Nauman, Serra, Snow, and others. These spaces included the Park Place Gallery — where *Piano Phase* received its premiere —, the Whitney Museum of Art, and the Museum of Modern Art in New York. Many of these artists also had personal interactions and forged friendships — LeWitt purchased sketches and scores from Reich, for example, while Serra exchanged his *Candle Piece* for the manuscript of *Pendulum Music* — which served to shape and then habituate the idea that intellectual and artistic proclivities could be shared across media. The close alliance between music and the visual arts was everywhere evident in the Minimalist milieu. For example, Reich's iconic essay „Music as a Gradual Process“ recapitulated both the stylistics and the content of Sol LeWitt's „Paragraphs on Conceptual Art“.² Their works too shared common ground. A work like LeWitt's *Arcs, Circles, and Grids*, for instance could practically stand as the visual analog to *Piano Phase*. Both are sectional and deploy a gradually unfolding process, which is simultaneously immediately obvious and elusively obscure. Unguessed at configurations emerge which LeWitt calls „side effects“ in „Sentence 28“ of his „Paragraphs on Conceptual Art“ not unlike the „resultant patterns“ found in Reich's musical lexicon in „Music as a Gradual Process“. Both essays were published in 1967 — attendant to the premiere of *Piano Phase*. In short, metaphors taken from the visual arts dominated the discourse on Minimalism.

As the century progressed, not all the commentary on Minimalism remained beholden to purely formal concerns. As far as music was concerned, one myth that came to exert a comparable animating force in the reception of Minimalism was enmeshed in new strains of academic method that captured the imagination of musicology in the 1990s. The new musicological tendency was to regard all music as cultural practice. Disavowing the „ingrained formalism“ of the minimalist *œuvre*, for instance, Robert Fink associated minimalist music with mass-marketing campaigns, mainstream musical listening (such as disco), and contemporary modes of musical learning.³ This effort to enlarge the anthropological

scope of the inquiry was accompanied by a contextualist rebuke of formalism. The musicological turn to cultural practice therefore had a double duty to pay. To satisfy the critics of formalist retreat, it had to portray cultural labor and practice; to satisfy the critics of postcolonial appropriation, it had to portray (white) American cultural labor and practice.

Fink's argument was not misleading *per se*. Indeed, the mainstreaming of the sound of Minimalism — the cross-rhythmic marimba style of the first iconic iPhone ringtone, released in 2007, for example, was an imitative echo of Reich's signature sound — underscored the pervasive Minimalist soundscapes of a localized American (techno-) *terroir*. What inevitably follows in such an argument, however, is the occlusion of African cultural labor and practice from the argumentative scene: African music becomes a cursory presence flitting across the pages of commentary now and again to index an influence on Reich (among numerous other influences) or to signal a form of encouragement for Reich (again, among numerous such forms). In more ways than one the logic of Minimalism itself thus made the incorporation of the African continent into the larger picture unwieldy and difficult. In other words, both the self-enclosed processual aesthetics articulated by the composer himself as well as the oculo-centric Minimalist descriptors from the visual arts produced rich formalisms that inevitably contained the expansive cultural reach of the music.⁴ On the other hand, to the extent that cultural and critical descriptors played a role in the literature, they were generally confined to a mainstream American perspective on the music.⁵ By locating the historically significant achievement of Minimalism in terms that jostled between aesthetic formalism and cultural contextualism, these dueling perspectives shifted the constitutive role of non-Western music itself onto a distant horizon. The constraints of the genre therefore made silence about Africa the norm.

2. Visual Analytics for *Piano Phase*: Misnomers of Voice Leading

Putting aside this methodological conundrum, what are some of the insights gained by those for whom the visual arts provide the grounding metaphors for Minimalism, on the one hand, and those for whom the cultural interpretation of Minimalism is confined to America? In his article „Going Flat: Post-Hierarchical Music Theory and the Musical Surface,“ Robert Fink combines both perspectives.⁶ On the one hand, he outlines an American postmodern cultural condition, of which Minimalism is an exemplary expression; and, on the other, he extends the dominant visual metaphorical mode of hearing to his actual analysis of minimalist music. As the title of his article suggests, Fink is primarily driven by desire for *flatness*, which he describes in terms of postmodernism. Drawing on the work of Clement Greenberg, Michel Foucault, and Frederic Jameson, Fink writes:

*Ultimately, the surface-depth metaphor feels increasingly irrelevant to the new, exotic topographies characteristic of the postmodern work of art. When we recognize new kinds of space in a late twentieth-century piece of music ... shouldn't our analytical models (and the subsequent value-judgments) ,mutate' right along with them?'*⁷

Aside from offering an analysis of Minimalist music, Fink's analytic project is directed towards a general revision of music theory's central preoccupations in the academy today.

Here are some of the primary points of Fink's argument. Politically speaking, his re-orientation of analytic perspective appreciates the way that „non-transcendental powers of hearing and attention“ to what Fink calls „all surface“ challenge outmoded notions of high and low art no less than the bourgeois subjectivity required to uphold it.⁸ Fink writes:

*The hierarchic connection between background and foreground forms a crucial bulwark against the dissolution of both music and the bourgeois ego in a decadent age dominated by egalitarian mass culture.*⁹

Fink is critical of the contempt shown by theorists who uphold the surface-depth toward an „entire class of people“ that are aligned with this egalitarian culture.¹⁰ It should be noted that Fink's article, published in 1999, was written one year before the arrival of the open digital networks that facilitated musical downloads, and later streaming on the internet. Following a host of corporate mergers (between record labels and CD manufacturers), as well as the passing of the 1996 Telecommunications Act in the United States (which regulated radio and television ownership), the 1990s witnessed an increased vertical and horizontal integration and consolidation of popular music's industrial distribution and production. In other words, the idea that „mass culture“ could plausibly stand as an emblem of „egalitarianism“ toward the end of the 20th century should be contested. One might even add that Fink's resolute focus on so-called „all surface“ phenomena — echoing the general postmodern prohibition on grand- or meta-narratives — thereby necessarily disavows the dialectics of escalating mass media power and control. In short, fear of „totalizing representations“ misses the often cartel-like („totalizing“) formations and synergies that marked the production and dissemination of mass musical culture in the late 1990s.¹¹

Musically speaking, Fink's re-orientation appreciates the way postmodern works of art cannot be adequately theorized in terms of outmoded analytic mechanisms that seek out „underlying voice-leading hierarchy (that is tonal ,perspective')“.¹² Using the painterly metaphor of ,perspective' to portray tonal hierarchies (such as we find in the thought of Heinrich Schenker, and others), Fink, in sync with the aesthetic demands of Sol LeWitt and other contemporary visual

artists, hears *Piano Phase* as „stubbornly anti-illusionistic“ — „*Piano Phase*,“ writes Fink, „is nothing *but* surface“. ¹³ The hierarchy of *Piano Phase* is „degraded“; its linear ascent (from d2 to e2) is „rudimentary“; and its tonality is „two-dimensional, blandly consonant, somehow flat and unreal, without perspective“. ¹⁴ Given these assertions, it is somewhat puzzling that Fink limits his discussion of *Piano Phase* to the discredited terrain of long-range voice-leading alone. That said, he is careful to distinguish this long-range situation from traditional notions of voice-leading: „In this degraded hierarchy, the surface holds itself together, and surface linear progressions are the only voice-leading we need“. ¹⁵ This is the flat painterly „surface“ that characterizes the all-over pattern of *Piano Phase*?

What does painterly surface such as this actually *sound* like? Unfortunately, Fink limits his analysis of *Piano Phase* to the perspective of the „long-range“ motion, demonstrating the relationship *between* its three major sections rather than the workings of the processes *within* which each of these sections unfold. Thus, the analysis is focused on exactly those aspects that are *not* readily grasped in a painterly sense — the rhythmic interlacing, resultant patterns, and so on — as well as those that are *least* thematized in Reich’s „Music as a Gradual Process“ — the idea that the sounding forms are identical to the music’s processes, and so on. Fink nonetheless points out an upward „linear implication“ in the first section of *Piano Phase*, namely the „longest conjunct motion – a B-C#-D progression that focuses all attention on d2 as soprano note“. ¹⁶ Fink argues that, because it is „repeated more than 400 times, this melodic fragment creates a cumulatively irresistible desire for the next scale step e2“. ¹⁷ Could it be that the „desire“ to move to e² is more questionable than plausible, let alone „irresistible“?

First, to speak of „implication“ and „desire“ produced by linear motion is to assume a somewhat traditional tonal pitch space. This, at a minimum, warrants a musical environment in which a seven-tone diatonic pitch-class collection more or less circulates. In contrast, *Piano Phase* actually operates within a pentatonic environment, which, if at all, articulates with a highly ambiguous *modal* pitch space. In other words, the basic unit presents only five tones (E, F#, B, C# and D), which facilitates the perception of a *variety* of modes. Even if we restrict our perceptual focus to only two possible modal centers, namely E and B (suggested by their position as the lowest boundary pitches in their respective registers), the module presents us with options. Figure 1 lays out the four possibilities for seven-tone scale formation in *Piano Phase*. To complete a seven-tone collection, the intervening pitches could be either G or G# and A or A#. The four resulting possibilities present, in turn, two options. Thus, Possibility A (interpolating the pitches G and A) produces a Dorian mode with E as the tonal center or an Aeolian mode with B as the tonal center. Possibility B (interpolating the pitches G# and A) produces a Mixolydian mode with E as the tonal center

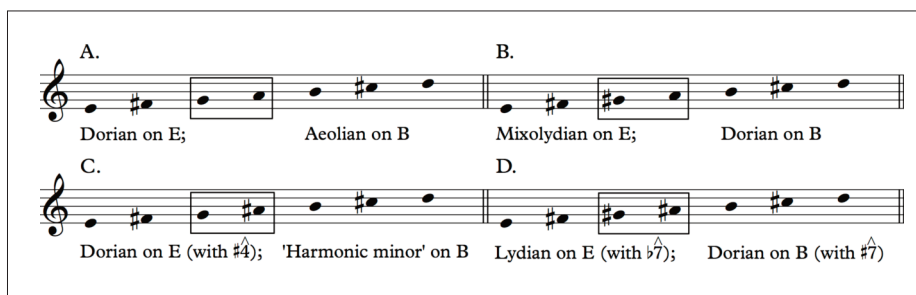


Figure 1: Four Possible Seven-Tone Pitch Collections in *Piano Phase*

or a Dorian mode with B as the tonal center. Possibilities C and D present non-traditional scale configurations; the latter produces either a Lydian mode with a flattened seventh degree or a Dorian mode with a sharpened seventh degree, while the former produces a Dorian mode with a raised fourth degree or a so-called „harmonic minor“ scale. None of these options encourages the tonal hearing required to hear the linear „implication“ responsible for the „desire“ to „resolve up to the octave“.¹⁸

Second, even if the pitch collection in *Piano Phase* could be construed as issuing tonal implications, these would be cancelled by the hyperbolic repetition of the module. In other words, the 400-fold repetition of the same basic pitch collection, far from creating a „cumulatively irresistible desire“ for a linear implication, in fact cancels the functional principle attendant to long-range contrapuntal designs.¹⁹ Repetition-without-limit, one might say, releases the grip of tonal mechanisms for evoking desire and expectation. Strangely, Fink is not the only theorist who invests *Piano Phase* with latent tonal propensities. Keith Potter, for example, grants the first section an ambiguous tonal center on B because it facilitates the „formation of iv-v-I in this key by the first three notes of the Basic Unit, and the rise and fall from B to D and back to the upper voice“.²⁰ In contrast, Fink invests E with tonal centrality. He thus reads the pitch B as a „dissonant seventh“ seeking to „resolve up“ instead of down.²¹ Even if we do invest in hearing this way, however, how does the *flattened* seventh degree in this pitch-space create an urge for the „next scale step, e2“?²² Unless it is in service of a rare expressive gesture, the flattened seventh degree in traditional tonal pitch space tends to move downward, not upward; it is the *raised* seventh degree that has a tradition of moving upward. In other words, a case for the seventh degree in *Piano Phase* prompting an upward resolution becomes faintly plausible only if the highest note of *Piano Phase* were D#, instead of D natural.

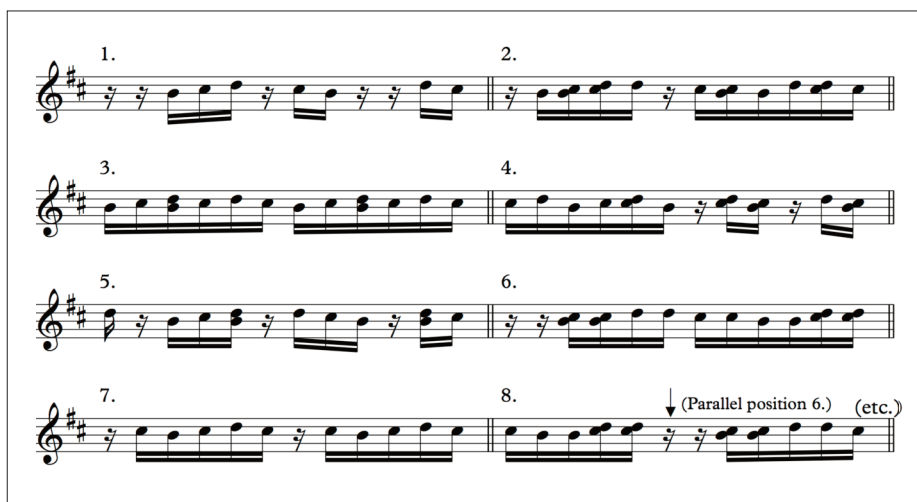


Figure 2: Upper Register Figures for Phasing Positions in *Piano Phase*

Fink's visual orientation becomes still more problematic when one gauges the „linear implication“ said to operate across the span of *Piano Phase*. Here, the analytic findings are beholden to the way things seem to *look* on the score. Let me explain. To make the case for a desire for a resolution upward, Fink seems to rely entirely on the *direction* of the „conjunct motion“ of the B–C#–D pattern that coalesces in the music's upper register: „Our overall linear impression of the first phase cycle (1–15) is of the rising third, B–D“.²³ Although this ascent is clearly visible in the first six-note unit of the model, can conjunct motion of this sort capture the overall linearity attendant to the constantly morphing upper configuration involving B, C# and D in the first part of the piece? Scanning the entire piece, it can be noted that, instead of presenting an overall upward directional tendency, the pattern's various incarnations in twelve phasing relations are marked by a fascinatingly awkward kind of symmetry. Figure 2 depicts the resulting B–C#–D configurations for all twelve phasing positions (labeled 1 to 12). Even in the unison position (which Fink seems to have most evidently in mind), the upward impetus is offset by the sequence-like two-note descending motives in the second half of the pattern.

Since the second position (where the patterns have separated by one pulse) arguably sustains a blurred version of the melodic contour found in the unison position, it is possible to speak of a faint upward impetus. But the situation in the second position does not enhance this hearing at least because the two-note sequences have extended to three-note sequences ending on the lowest note of

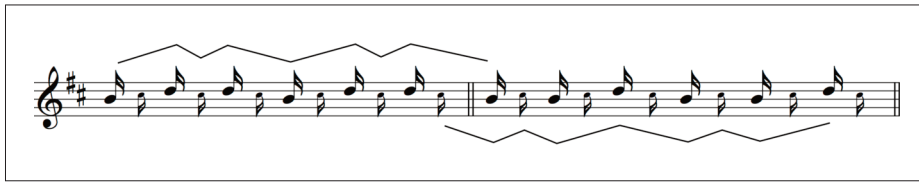


Figure 2.3: Inversional Symmetries in Phase Position 3 of *Piano Phase*



Figure 2.4: Inversional Symmetries in Phase Position 4 of *Piano Phase*

the three-note figure. From this point on, the phasing positions present configurations that resolutely cancel ascending implications. The resulting pattern in the third position presents a wave-like motion oscillating between at least two ways of investing directionality: the oscillation alternately bordering B once and then D twice or the oscillation bordering B twice and then D once (See Figure 2.3). These options, taken on their own, do not issue forth decisive directional pulls; taken together, even less so. Indeed, the resulting wave-like motions are delicately poised between rising and falling melodic movement (depicted by the symmetrical contours above and below the respective staves in the diagram). The fourth position presents differently symmetrical patterns (See Figure 2.4. In this case, however, if an overall motion is implied at all, it is probably downward. Here one may speak of two four-note figures (retrograde inversions of one another) in a kind of sequential descent, followed by a separate descending dissonant two-note figure.

The fifth position elicits an intricate polyphonic situation wherein the upper melodic constellations elegantly balance upward with downward motion. Three three-note figures present three perceptual options depending on how we invest the B–D simultaneity on pulses 5 and 11 of the measure. Figure 2.5 (A; next page) depicts the melodic contour if we emphasize D in the dyad; Figure 2.5 (B) depicts the contour if we emphasize B; Figure 2.5 (C) emphasizes first B then D; and Figure 2.5 (D) emphasizes first D then B. Given the unambiguous downward pull of the figure beginning on the seventh pulse, it is fas-

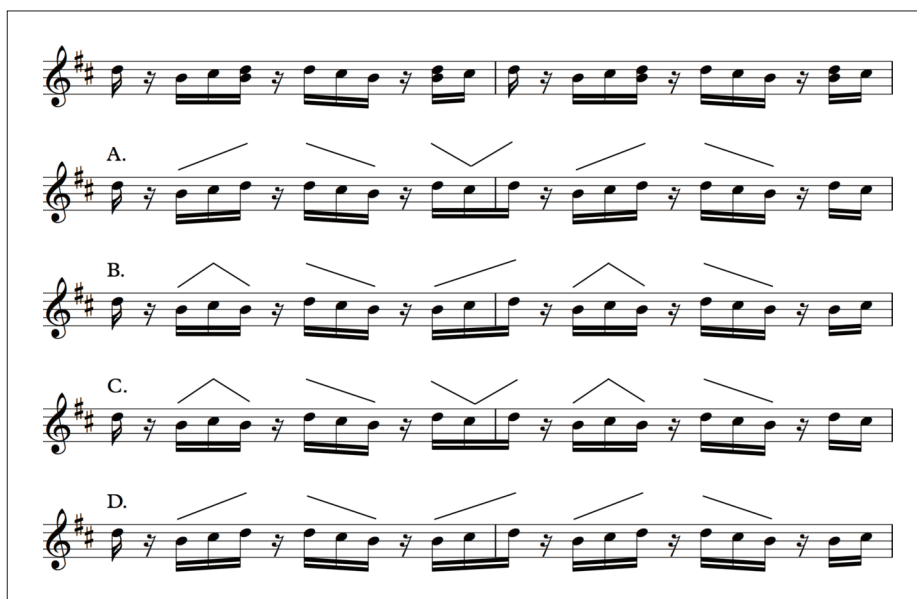


Figure 2.5: Diverse Symmetries and Near-Symmetries in Phase Position 5 of *Piano Phase*

inating to note that, taken together, we find precisely as many figures with upward tendencies as we do with downward tendencies. At the least, an „overall“ upward direction cannot be sustained in this phase position. The repeated notes of the upper tones in the sixth position present a single snake-like figure with fused dissonances at the beginning and the end. The melodic motion rises by step, descends by three steps and then rises again. It does not ascend overall as much as it returns to its starting point. In the seventh position two identical snake-like figures, this time descending first by step, then rising by three steps before falling back again to their starting pitch, unfold at double speed. This resultant pattern is like an inverted diminution of the figure in the sixth position. Under the perceptual rubric of melodic directionality, then, these resulting patterns, while never quite predictable, generally tend to balance upward with downward motion. In short, the many three-note figures in the upper register of *Piano Phase* do not create Fink’s desired „desire for the next scale step e^2 “ without undue strain.²⁴ Such a desire may even be aurally impossible.

The firm visualist orientation to listening pertains to Fink’s analysis of the other two sections of *Piano Phase* as well. For example, Fink intensifies his voice-leading analysis by arguing that the final section overwhelmingly elaborates ascending musical motion: „Since the other two notes of [the final] pattern ...

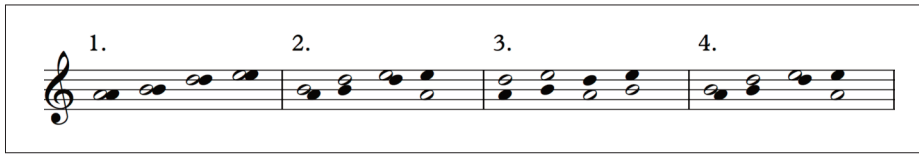


Figure 3: Phasing Positions for Section 3 of *Piano Phase*



Figure 3.3: Three Modalities in Phasing Position 3 of Section 3 of *Piano Phase*

form the ascending step A–B, rising linear motion comes to dominate the texture completely”.²⁵ Fink calls into service Leonard Meyer and Eugene Narmour’s „implication-realization“ model of musical listening to argue that the final section realizes / resolves implications in the first pattern. *Piano Phase*, he writes, „exhibit[s] a progression from the tense balance of rising and falling implications in [the first section] to the simple upward sweep of [the final section]”.²⁶ But how *simple* is this upward sweep? Once again, while visually suggested by the score when both pianists are in phase with one another, the upward tendency cannot be sustained in the context of the many figures that emerge within the actual phasing positions. As with Section 1, these present qualitatively shifting directional pulls (See Figure 3). For example, the third position (depicted in Figure 3.3) sounds more like a perfect fourth oscillating back and forth (as depicted in Figure 3.3.A). The ability to hear this pattern as an „upward sweep“ involves, against odds, suppressing the obvious homophonic fallout of this phase position, and figuring the resulting pattern canonically instead, with two pulses separating canonic strands (as in Figure 3.3.B). Yet, such a hearing readily accomplishes the opposite result as well. Beginning on the highest note E, that is, we can aurally trace equivalent canonically unfolding *downward* sweeps separated by two pulses (as in Figure 3.3.C).

Fink’s detailed, but aurally incomplete (if not implausible), analysis results from an overdrawn allegiance to a simple visual approach to the score. As this cursory corrective indicates, the phenomenology of perception here is a good deal more complex than Fink’s optic will permit. In theoretical compliance with the central categories depicting Minimalism in the visual arts, Fink advances

the apparent musical *surface* of *Piano Phase* as a representative type. He argues that

*this collapsing of voice-leading and functional hierarchies is one of the most characteristic features of minimalist tonality – a two-dimensional tonality which seems, even at its most blandly consonant, somehow flat and unreal, without perspective, stubbornly anti-illusionistic.*²⁷

The idea that Minimalism of this sort is somehow allied with Sol LeWitt's anti-illusionist approach to visual art was a common theme in writings on Minimalism. For example, years before Fink made the same remarks, Simon Shaw-Miller deployed Reich's *Piano Phase* (and Glass' *Two Pages* of 1969) as exemplars of works whose abbreviated rhythmic values, pitches and instrumentation „produce[] an effect of musical surface“.²⁸

Drawing on LeWitt's approach to perspective, Shaw-Miller argues that the all-over pattern of Minimalist music — horizontal surface against vertical depth — was likewise an anti-illusionist art. He argues further:

*As Stella used manufactured paint, so the aural, and sometimes textual, impression of much musical minimalism is likewise ,premanufactured,' a quasi-industrial process of familiar musical units ,bolted' together. The feeling of surface is also invoked through the constant pulse and repetition of much minimalist music, which sets up a screen of expectation while placing in the foreground only limited change, giving a sense of ,flatness'-continuity in time as the music ,unfolds,' as there is continuity in space with minimal art.*²⁹

Having likely drawn inspiration from Shaw-Miller's remarks, Fink harnessed notions of surface and flatness to characterize Reich's Minimalism. Above all, Fink harnessed the openly illusionistic *Piano Phase* paradoxically to advance the illusion of its anti-illusion. To invert the terms associated with critics such as Susan Sontag, the apparently literal (flat) listening to unhidden (surface) structural procedures and materials here paradoxically straitened the world of Minimalist music into a surrogate mental scheme of ocular categories. A close analysis of the very discourse surrounding Minimalism would itself be an instructive lesson in how discourse ostensibly grounded in the cultural and institutional contexts of the sites of production of apparently dissimilar artistic media became formalized in textualized accounts of their affinity; how — through repetitive storytelling itself — history was again patterned into a kind of myth.

3. Audile Analytics for *Piano Phase*: Asynchronous Sound and Second-Order Phasing

Aside from his official aesthetic pronouncements about it, Reich's personal account of the compositional process that led to *Piano Phase* primarily involved a kind

of techno-mechanical glitch that occurred with his experiments with tape loops in *It's Gonna Rain* (1965) and *Come Out* (1966). In other words, the tape loops on the Wollensak reel-to-reel recorder automatically went out of phase with one another because of incremental time differences in the rotating reel carriers. As a result, the spoken tape samples shifted out of phase with one another gradually, producing an interesting study in the phenomenology of sound perception. In his own descriptions of it, Reich mostly took credit for the insight into the phasing technique: „My basic insight into change of phase between two repeating patterns was made by observing two tape loops on two tape recorders“.³⁰ In his next piece, *Piano Phase*, Reich attempted to bring this kind of gradual process to live performance. The basic idea was that one performer would gradually speed up a patterned module against the same module played strictly in tempo by another performer. On the one hand, this is a compelling account of the origins of the phasing idea; its quasi-determinism even adds an external dimension of *withdrawal* from the very compositional maneuvering Minimalist artists sought to place in doubt.

On the other hand, as I have argued elsewhere, this techno-mechanical account must be weighed against Reich's initial intentions for his tape loops pieces; in particular, Reich's attempt in *It's Gonna Rain* to actually disalign the tape loops with one another from the start. Reich derived this mode of disalignment from the African canonic practices outlined in the published work of the anthropologist A. M. Jones.³¹ I cannot outline Reich's full debt to this particular African technique here, except briefly to illustrate it with the composer's own words. Despite claims to his own insight about it, Reich also states, for example, that „seeing the book of African transcriptions by A. M. Jones undoubtedly helped prepare me to take a strong interest in the phasing process“.³² Elsewhere, Reich recalls,

*I had heard African music but ... I didn't know how it was put together. So to see in notation overlapping rhythmic patterns put together so their down-beats do not coincide showed me a radical new way of making music.*³³

Canonic phasing of this sort presented a „radically different way of making music,“ which for Reich „suggested the multiple simultaneous tape loops [he] was beginning to experiment with at the time“.³⁴ What is required here is a revision of both the historical and the technical grasp of this musical moment of invention.

Technically speaking, the simultaneous tape loops were not initially set up to run in sync at all (after which, the story goes, they fell out of sync by incremental mechanical shifts), but instead set up to run precisely *out-of-sync* — „exactly 180 degrees out of phase“ in Reich's words — in a manner that reflected the staggered rhythmic relationships described and notated in *Studies in African Music*.³⁵ Reich's encounter with disaligned downbeats in canonic relation dated

back to 1962, the year he purchased Jones' book. In other words, the glitch in the machine in 1965 was less a matter of a de-synchronization of tape reels in unison than it was a re-synchronization of reels configured in staggered canons. Although this particular debt to African practice is largely missed by the scholarly and critical commentary on his early music, Reich rarely actually denies the source of the fundamental phasing idea. He states, for example, that Jones's transcriptions were „a very potent piece of information, especially for someone fooling around with tape loops, „which I began to view as little mechanized Africans“.³⁶ While the metaphor is troubling, one should not be overly distracted by Reich's dehumanizing grasp of his primary creative interlocutors in this sentence, for it is but a small symptom of a much more troubling and widespread disavowal of African capacity cast in more palatable, but also more deeply entrenched, interpretations of Reich's Minimalism.

What distinguishes *Piano Phase* from the tape loop pieces of 1965 and 1966 was less the idea that a mechanical glitch was now rendered by live performers than it was the introduction of a distinctly-designed interlocking module that produced an array of „resultant patterns“ — a term describing the „psycho-acoustic by-products of the repetition and phase-shifting,“ which Reich claimed to invent.³⁷ Indeed, the malleability of the modal material of *Piano Phase* facilitates a shift in perception away from functionality toward rhythmic-melodic processes. The interlocking of two ternary units in the left hand (e^1, b^2, d^2) with three binary units in the right ($f\#^2, c\#^2$), furthermore, assures a complex and shifting metric situation, producing rhythmic groupings marked by the various divisions of 12 units into $6 \times 2, 2 \times 6, 3 \times 4, 4 \times 3, 5 + 7, 7 + 5$, among others. The striking thing about the patterned fallout of each phase position is the sharp transformational relation each phase position has to another. In other words, with each new phase position, the very *modality of listening* undergoes a metamorphosis. In other words, phase position 1 is sharply dissonant, a blurry rendering of the original melodic contour; phase position 2 is a wholly consonant homophonic texture that splits the structure in two parts, as if suddenly to simplify the music and double its tempo; phase position 3 is like 16th-century two-part polyphonic environment, blending consonance with dissonance; phase position 4 is classically motivic, playfully interlocking three and two-note entities that mirror and invert one another; phase position 5 once again presents a kind of restatement of the original pattern, but this time curiously harmonized with a progression that moves from dissonance to consonance and back again in waves; and, finally, phase position 6 oscillates the rising three note figure against a strident dyad pulsing on the offbeat like 1990s EDM.³⁸

Phase positions 7 to 11 recapitulate the patterns at phase positions 1 to 6 in reverse order, only now they are set adrift of their original metric coordinates. This is a kind of second-order phasing relation within a new phase position, to which I will return. For now, it suffices to say that these distinct permutations



Figure 4: Paul Epstein's Masked Canonic Relations in Phase Position 2 of *Piano Phase* (1986: p. 498)
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are the striking — often quite suddenly emergent — acoustical illusions that result from a gradual process. In short, the continuity of the canonic process is asynchronous with the disjointed permutations of the resulting melodic-rhythmic patterns. The breathtaking complexities of those patterns that fleetingly emerge *between* phase positions — as if to accelerate the music toward the threshold of hearability — only further enhance the illusionism inherent to the process. To invert Serra's terms, this is music of dizzying illusion, not of anti-illusion. More importantly, to invert Reich's Minimalist mantra, this is „a compositional process and a sounding music“ that are emphatically *not* „one and the same thing“.³⁹ The motor patterns played by the two pianists are starkly disaligned from the sounding forms that come to the listening ear.

There are many fascinating audile conundrums facing the listener of *Piano Phase*. This is because many patterns are not quite what they seem. Even the simplest patterns are frequently borne of transformational situations that exceed their immediately-obvious structure. In a remarkable short article, for example, Paul Epstein notes that the simple homophonic-seeming pattern at phase position 2 not only articulates a canon beginning on time-points 1 and 11, but embeds an additional canon beginning on time-points 5 and 7 respectively (See Figure 4). Expanding upon Epstein's insight, when the total pattern at phase position 2 *recurs* at phase position 10, this time set adrift by two time-points, these additional canonic lines appear on time-points 3, 7 and 9 respectively. The latter pattern is interesting because, while the phasing process has moved back by 10 time-points, the total pattern has shifted forward by 2 time points — a second-order phasing, or phasing within phasing. Taken together, the two appearances of this simple homophonic (ostensibly six-note) pattern in *Piano Phase* therefore articulate twelve-note canonic voices on time-points 1, 3, 5, 7, 9, and 11. What is striking about this kind of pattern in *Piano Phase* is that the logic of its transformational production exceeds its immediate sounding form, and yet embedded within it, the pattern simultaneously distributes transformational lines that likewise exceed the logic of its production. This multiplication of internal repetitions has various structural consequences, not least for meter for-

mation. Far from signaling a stable metric ground for evolving rhythmic relationships, for example, *Piano Phase* actually produces inherent sub-patterns that generate a shift in meter. In the case of the pattern in phase position 2, especially when considered along with its reincarnation as a second-order phase pattern in position 10, we find an array of equally valid metric downbeats on all odd-numbered time-points. But the canonic voices are not the only musical elements to vie for meter formation. For example, the open fifth dyad that pulses on the offbeat of all even-numbered time-points in the same pattern actually reorients the primary beat precisely toward the spaces left by these canonic voices. The downbeat, in short, could be placed on almost any time point with equal validity — it is maximally metrically ambiguous.

4. African Analytics for *Piano Phase*: Social Life of Okukonera

What is striking about the above analytic corrective to the oculo-centrism of the „flatness“-theory outlined in Section 2 is that it recapitulates some of the fundamental theoretical features of African music of the pre-colonial era. *Piano Phase* is directly based on the structure of Kiganda xylophone music. Reich appropriated the concept of „resultant pattern“ — perhaps the most fundamental sonic-aesthetic idea of his entire musical output — from the Lugandan concept of *Okukonera*. Although he claimed to invent the „resultant pattern“ idea in 1967, the term is in fact borrowed from Kubik’s descriptions of „inherent or subjective rhythms“, which he coined to describe the *Okukonera* phenomenon in 1959. Kubik published his description and analysis of „inherent rhythms“ in two prominent articles for *African Music Society Journal* in 1960 and 1962. The concept describes a phenomenological feature of certain types of South, East and Central African music — notably music for *likembe*, zither, harp, lyre and xylophone — whereby the interwoven division of the performance labor, as it interfaces with the technical design of the instruments, produces audible melodic-rhythmic lines that appear as if of their own accord. In the context of *Amadinda* music, these crisscrossing ghost patterns are accorded special prominence and assigned a name. Kyagam-biddwa describes their hallucinatory appearance as a voice part that „mysteriously looms up,“ while Kubik describes them as indirect polyphonic lines — „as if the spirit were talking“.⁴⁰

In *Amadinda* music, inherent rhythms are produced by the interaction of two musical parts (known as *Okunaga* and *Okwawula*, performed by *Omwuzi* and *Omunazi* respectively), which render interlocking melodic phrases (of varying length — from as few as two pulses to as many as seventy pulses) at incredibly high speed (ranging from anywhere between 200 to 600 pulses per minute). Because both performers execute their phrases in parallel octaves (*myanjo*) within a shared pitch ambit — they stand across from one another and perform on the same xylophone keys —, the interwoven lines produce a third entity that is qua-

litatively distinct from the individual phrases. A third performer, the *Omu-konezi*, seated at the high notes of the xylophone, emphasizes an aspect of this new *Gestalt* — the irregular bass line produced by the lowest tones of the total configuration — by doubling the line an octave higher (See Figure 5). This is the crux of *Amadinda* performance, the eliciting of an emergent entity, which Kubik calls inherent rhythm; the Lugandan *Okukonera*.

In his 1962 article, „The Phenomenon of Inherent Rhythms in East and Central African Instrumental Music“, Kubik lays out the basic conditions for the successful production of *Okukonera* lines. These include musical phrases characterized by large disjunct intervals, a metrically unaccented performance, interlocking at high speed, and perceptual proximity of notes of one phrase with those of the other.⁴² Two distinct patterns are thereby woven together in such a way that their internal elements fuse across their respective thresholds, the better to transition toward an entity that is not under the direct charge of either performer. This produces a kind of epiphany of phenomenological reversal, whereby the listener „subconsciously associates“ tonal groupings from either part.⁴³ Without describing the precise workings of inherent rhythm formation in any further detail, it is clear that the nested left and right hand groupings in *Piano Phase* follow Kubik’s specifications precisely. Two short phrases — one ternary, one binary — are nested within each other (See Figure 6). The phrases are both characterized by large interval leaps. They are performed at high speed — in unaccented interlocking fashion — with the result that they form distinct contrapuntal motives — conjoining e1 and F#2, on the one hand, and b², C#2, and d2, on the other.

If we compare the basic structure of *Piano Phase* with that of the first simple *Amadinda* composition — *Olutalo Olwe Nsinsi* („The Battle of Nsinsi“) — notated



Figure 5: Kubik’s Representation of Amadinda Musicians (1960, p. 10)⁴¹
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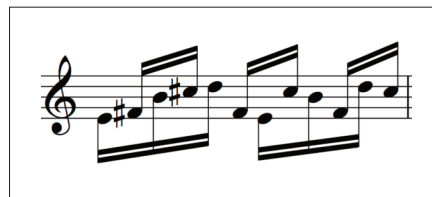


Figure 6: The Basic Module of *Piano Phase*

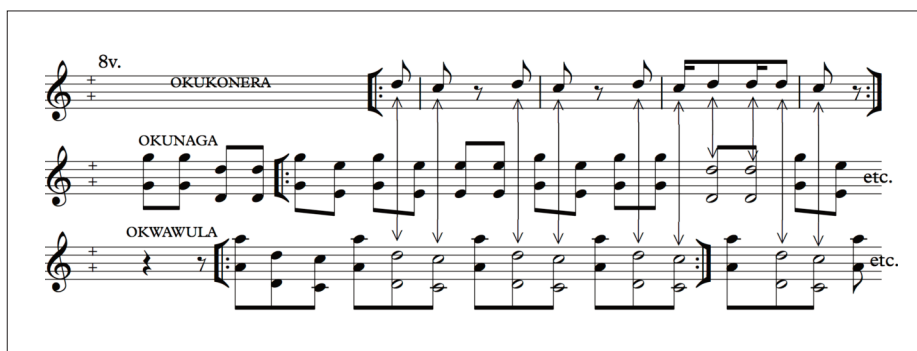


Figure 7: Kubik's Short Transcription of *Olutalwo Olwe Nsinsi*⁴⁸

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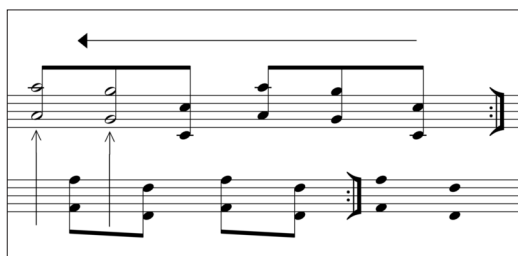


Figure 8: An Inversion of a Fragment of *Olutalwo Olwe Nsinsi*

by Kubik in his article „The Structure of Kiganda Xylophone Music“ (1960), the affinities between them become apparent (See Figure 7). First, as it is with the *Amadinda* composition, *Piano Phase* deploys a pentatonic collection patterned around intervals of a second, fourth, fifth and a (minor) seventh. Kubik is careful to point out that the tuning of the *Amadinda*

actually approximates an equidistant layout of notes, with occasional „microtonal divergencies“.⁴⁴ This might imply a different modal layout to that found in *Piano Phase*. However, on close reading, Kubik also shows that the peculiar materiality of the keys issues additional tones that „often sound a third smaller to the ear“.⁴⁵ As a result of the „thirds phenomenon“, intervals of a second are reintroduced into the pitch space of the *Amadinda*.⁴⁶ In addition, as in *Olutalwo*, Reich's module is contained within the octave, traversing a span of a minor seventh. This reflects a condition for the successful formation of inherent rhythms. In the words of Kubik: „The melodies never exceed the range of a Kiganda seventh (from C to A+)“.⁴⁷ The mark + indicates a quartertone up, such that C to A+ indicates a span of a (very) flat seventh. In *Piano Phase*, the internal modal arrangement, as well as the span of a minor seventh, best approximates the African tuning within the confines of diatonic layout.

The second affinity between *Piano Phase* and *Olutalwo* is the interweaving of a binary figure (played by the left hand in the former, and indicated by the *Oku-*

naga part in octaves in the latter) with a ternary figure (played by the right hand, and indicated by the *Okwawula*, respectively). As it is in *Olutalwo*, the ternary module in *Piano Phase* spans the interval of a flattened seventh. One might even want to suggest that the *Piano Phase* module is a kind of retrograde inversion of a half-length fragment of *Olutalwo* (See Figure 8). (Perhaps it is no surprise that A. M. Jones, who mistakenly heard it in reverse on a tape recording in the summer of 1967, instantly associated *Piano Phase* with *Amadinda* music!) In *Piano Phase*, these figures are rendered at a tempo of 216 pulses per minute, which is on the slower side of *Amadinda* performance practice, but still within its traditional range. Most importantly, however, the *Amadinda* composition is structured to maximize the production of an inherent rhythm, which is indicated by the *Okukonera* part notated on the third staff in Kubik's representation in Figure 8. The *Okukonera* doubles at the octave the rhythm produced by Cs and Ds in the total pattern. While Reich does not deploy a third player to emphasize this inherent rhythm, it is clear that the construction of what he dubbed „resultant patterns“ was for him an important compositional preoccupation. In his next work, *Violin Phase* (1967), Reich began to double the resultant pattern, thereby channeling the role of the *Omwawuzi* in an *Amadinda* setting. Reich would use this technique in all his ensuing compositions. From this point onward, in other words, an African *Okukonera*-type technique became the central hallmark of Reich's compositional style.

It is important to show that *Piano Phase* also departs from the music of the *Amadinda* in certain respects. For the most part, the composer tends to simplify matters in various ways. First, instead of assigning distinct interlocking parts to two performers (*Omwawuzi* and *Omunazi*) playing in octaves (*myanjo*) on opposite sides of the same instrument, Reich assigns the entire pattern to both performers, who play in monophonic lines on different instruments. Second, even though it is Kubik's simplest transcription in the 1960 publication, Reich deploys only a twelve-pulse pattern (half the length of *Olutalwo*) without any tonal shifts. In other words, where *Olutalwo* oscillates between two tonal centers, thereby also introducing a sixteenth-note variation to the *Okukonera* in the second half of the pattern, the *Piano Phase* module elaborates an unchanging harmonic field. Finally, because of the *modulo 5* pitch-space within which *Amadinda* music operates, *Olutalwo* can be rendered in five different transpositions (or *miko*), which involves a shifting palette for inherent rhythm formation. In other words, a transposition up by step would involve rotating the four lowest notes of the pattern up to the next highest scale degree; but it also involves rotating the highest note of the pattern (a minor seventh from the lowest note) to the *lowest* note of the transposed module. As a result, the actual melodic shape of each phrase shifts with each *muko*. I cannot elaborate on this in detail here, except to note that the linearity of pitch conception in the *Amadinda* hereby productively confronts the circularity of its pitch-class conception. As a result, the modal transpositions

(*miko*) have the net effect of rotating various inherent rhythms between inner, outer and middle voices. In contrast, *Piano Phase* does not rotate inherent patterns between voices as much as encounter new ones with every phase shift. It would not be too misleading schematically to assert that the language of *Piano Phase* is more purely *rhythmic*, while that of the *Amadinda* involves a more thoroughgoing interplay between rhythmic and harmonic dimensions. If *Piano Phase* could be described as music to generate the *Okukonera* by, the *Olutalo Okwe Nsinsi* is music to *rotate* the generated *Okukonera* by. This analysis hopes to draw attention to the value of this pre-colonial African musical practice for a contemporary world. Perhaps the illusionism of a perceived talking spirit in 1950s Africa — paradoxically repurposed as the anti-illusionism of a flat Minimalist surface in 1960s America — may guide the spirit of history once more.

¹ Dean Paul Suzuki: „Minimal Music: Its Evolution as Seen in the Works of Philip Glass, Steve Reich, Terry Riley, and La Monte Young,“ in *Volume 1*. Dissertation presented to the faculty of the Graduate School of the University of Southern California, May 1991, p. 122.

² For a more comprehensive account of the conceptual affinities between these essays, no less than the personal, philosophical and institutional overlap between Reich and the Minimalist visual artists, see my „Curious Intersections, Uncommon Magic: Steve Reich’s ‚It’s Gonna Rain‘ (1965),“ in *Current Musicology* 79–80 (2005), p. 7–45.

³ See Robert Fink’s *Repeating Ourselves: American Minimal Music as Cultural Practice*, Berkeley, CA 2005.

⁴ Some representative examples include Keith Potter’s *Four Musical Minimalists: La Monte Young, Terry Riley, Steve Reich, Philip Glass*, Cambridge 2000; K. Robert Schwarz’s „Minimalism / Music,“ in Claudia Swan (Ed.): *Perceptible Processes: Minimalism and the Baroque*, New York 1997; and Dean Paul Suzuki’s „Minimal Music ...“, op. cit.

⁵ Some representative examples include *Repeating Ourselves ...*, op. cit.; Sumanth Gopinath’s „A Composer Looks East’: Steve Reich and Discourse on Non-Western Music,“ in *Glendora Review: African Quarterly on the Arts* 3:3–4 (2004), p. 134–145; and Susan McClary’s „Rap, Minimalism, and Structures of Time in Late Twentieth-Century Culture,“ in Christopher Cox and Daniel Warner (Eds.): *Audioculture: Readings in Modern Music*, New York/London 2004, p. 289–298.

⁶ Robert Fink: „Going Flat: Post-Hierarchical Music Theory and the Musical Surface,“ in Nicholas Cook and Mark Everist (Eds.): *Rethinking Music*, Part 1, Oxford/New York 1999.

⁷ Fink: „Going Flat“, op. cit., p. 123.

⁸ *Ibid.*, p. 137.

⁹ *Ibid.*, p. 135.

¹⁰ *Ibid.*, p. 135.

¹¹ *Ibid.*, p. 102, 137.

¹² *Ibid.*, p. 127.

¹³ *Ibid.*, p. 127.

¹⁴ *Ibid.*, p. 125, 127.

¹⁵ *Ibid.*, p. 127.

- ¹⁶ Ibid., p. 125.
- ¹⁷ Ibid., p. 125.
- ¹⁸ Ibid., p. 125, 126.
- ¹⁹ Ibid., p. 125, emphasis added.
- ²⁰ Keith Potter: *Four Musical Minimalists ...*, op. cit., p. 187.
- ²¹ Fink: „Going Flat“, op. cit., p. 126.
- ²² Ibid., 125.
- ²³ Ibid., 125.
- ²⁴ Ibid., p. 127.
- ²⁵ Ibid., p. 126.
- ²⁶ Ibid., p. 126.
- ²⁷ Ibid., p. 127.
- ²⁸ Simon Shaw-Miller: *Visible Deeds of Music: Art and Music from Wagner to Cage*, New Haven/London 2002, p. 200.
- ²⁹ Ibid., p. 200.
- ³⁰ Steve Reich: *Writings on Music: 1965–2000*, Oxford 2002, p. 149.
- ³¹ A.M. Jones: *Studies in African Music: Volume I and II*, London 1959. For a fuller account of these techniques as they take up residency in Reich’s works, see my „Afro-Electric Counterpoint,“ in Sumanth Gopinath and Pwyll ap Sion (Eds.): *Rethinking Steve Reich*, Oxford, forthcoming 2018.
- ³² Reich: *Writings on Music*, p. 149.
- ³³ Reich in Andrew Ford: „Steve Reich: Opening and Closing Doors,“ in: *Composer to Composer: Conversations About Contemporary Music*, London 1993, p. 63.
- ³⁴ Reich: *Writings on Music*, p. 148.
- ³⁵ Ibid., p. 169.
- ³⁶ Reich in Mark Alburger: „Steve Reich: Early Phase,“ in: *21st Century Music*, Volume 11, Number 4, April 2004, p. 1–9, emphasis added, p. 3.
- ³⁷ Reich: *Writings on Music*, p. 206.
- ³⁸ For a fuller account of the structure of *Piano Phase*, see Paul Epstein’s „Pattern Structure and Process in Steve Reich’s *Piano Phase*“, in: *Musical Quarterly* 72 (1986), p. 494–502.
- ³⁹ Reich: *Writings on Music*, op. cit., p. 34.
- ⁴⁰ Gerhard Kubik: *Theory of African Music: Volume II*, Chicago/London 2010, p. 108.
- ⁴¹ Gerhard Kubik: „The Structure of Kiganda Xylophone Music,“ in: *African Music* 1/1 (1960), p. 6–30, 10.
- ⁴² Gerhard Kubik: „The Phenomenon of Inherent Rhythms in East and Central African Instrumental Music,“ in: *African Music* 3/1 (1962), 33–42, p. 37.
- ⁴³ Kubik: „The Structure of Kiganda ...“, op. cit., p. 13.
- ⁴⁴ Ibid., p. 8.
- ⁴⁵ Ibid., p. 8.
- ⁴⁶ Ibid., p. 9.
- ⁴⁷ Ibid., p. 12.
- ⁴⁸ Ibid., p. 16.