Unfolding the Object:
Reclaiming Fixed Media Works for Post-posthuman Performance

by

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Abstract

Relatively recent developments in music technology have led to the increased popularity of mechanical, prefabricated genres of art music, such as *musique concrète* and player piano rolls among experimental composers. These innovations have engendered a much more recent response on the part of performers of new music, who frequently bypass the original medium of a piece in an attempt to render it live. This paper develops and applies musicological and sociological tools in order to analyze the relationship between posthuman and post-posthuman performance in fixed media works by Brian Eno and Conlon Nancarrow. After tracing the historical roots of the practice of recomposition, I argue that the transformation of musical parameters which occurs in this transition both reveals and revises the sociocultural value of the original work.
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Acknowledgment

Let me be the first to acknowledge that the two case studies contained within this paper both center on white, male composers—one, an American expat; the other, a Brit. This inadvisable lack of inclusive representation is simply the result of a lack of foresight. Were I to begin the thesis process anew, I would balance my political values—namely, my belief that white men have taken up quite enough space already—with my rather more identity-impartial research interests. As long as I’m taking up space with my writing, composing, and recomposing, which I intend to continue, I hereby resolve going forward to use that space to honor and promote the work of artists with backgrounds distinct from my own.

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Introduction

The onslaught of the posthuman in the very late industrial age has put humans in an awkward position. Increasingly deprived of our repetitive, mechanical jobs, we scramble over each other for a prized position in one of the decreasing number of industries that seems impossible to automate. From the futurological vantage point afforded to denizens of the year 2018, it seems possible that it will not be terribly long before there no longer exist any jobs on an assembly line or behind a wheel. Will musicians, too, lose their jobs en masse to sample banks and virtual vibrato?

Though more commercially-oriented musical realms may indeed be facing such a cutback in instrumental personnel, experimental art music composers who engage with posthuman technologies tend to do so due less to avarice than to a frustration with the technical limitations of even the nimblest virtuosi. These artists crave extreme textures—the fastest of filigrees, the most convoluted polyrhythms, the flattest, deadest affect—which, they believe, are all but unachievable by humans. In the last few decades, intrepid musicians and ensembles have begun to put forth their disregard for this judgment, as well as acting on the feeling that “a lot of our favorite music wasn’t available to us as players”\(^1\) by reclaiming such works for human performance. Within these post-posthuman arrangements, performers breathe unprecedented life into their source material, both illuminating and challenging the mechanical nature of the work’s original aesthetic.

The twentieth century brought unprecedented technological innovations to art music, as it did to industry in general. Some composers disavowed common practice harmonic technology in favor of dissonant, newly synthesized compositional devices

\(^1\) Personal conversation with Evan Ziporyn, 4/9/18.
for traditional instrumentations. Others partially or completely abandoned live performance, focusing instead on fixed media. For any composer already positioned tangentially to the institution, aesthetically at odds with revered Western notions of musical beauty, the appeal of a work confined entirely to its tangible housing—e.g. a tape, or a player piano roll—is easy to understand. It need not receive a potentially costly performance for the composer to receive the fulfillment of hearing the piece aloud, thereby justifying the effort involved in crafting it. No coaxing of mortal musicians, who might privately long for the days of diatonicism, is required. Further, mechanical processes allow for a highly direct relationship between composer and sound object, cutting out the middlemen of the unreliable human performer and their unpredictable instrument. And, once the creative process is complete, the work sounds virtually the same upon each instance of reproduction, affected only by the acoustics of the operative sound system and its containing space.

The earliest tape tinkerers, especially Pierre Schaeffer, concerned themselves as much with the nature of sound and listening as with the art itself, expounding on the revelatory theoretical capacity of the newfound medium. Subsequent adopters of musique concrète—such as Edgard Varèse and Iannis Xenakis, united for the 1958 Poème électronique project in the Philips Pavilion—conducted spectacle as if the assembled crowd were an attentive orchestra, reacting sensationally and predictably to the deft configuration of sounds with unseen sources which, in their original contexts, would seem positively unmusical. Still others responded to the commercialized trajectory of recorded sound vis-à-vis canned Muzak, commenting on

\[^2\] Regrettably, most people still found the Poème quite unmusical.
and adapting its features for what they saw as more elevated purposes. Brian Eno and Conlon Nancarrow—the subjects, respectively, of the enclosed case studies—each engaged with all three of these discursive modes in their own manner, positioning themselves accordingly as participants in an avant-garde artistic dialogue which ruptures some aspect of an existing institution. In these cases, usually, the target for disruption is the old-model taste of the culturally omnipotent classical music scene.

The turn of the twenty-first century, approximately, augured an era of response to these posthuman—or, at least, post-performance—tendencies on the part of classical insiders. Contemporary ensembles such as Bang on a Can and Alarm Will Sound, just coming into their own as the new generation of elite, cutting-edge new music practitioners, compiled arrangements of works which had originally been conceived as fixed media and therefore incompatible with live performance. Though such endeavors have not yet been exhaustively analyzed or documented in the academic sphere, they provoke a fascinating set of questions about the relationship between human and nonhuman performers, as well as the political nature of music, its status as a piece of art, and what material constitutes such an object.

In both academic and popular cultural discourse, music is often described as a tool, utilized to transmit a certain position or set of values from composer to audience. Within a discussion of the purported power of political music, Lydia Goehr points out that cultural theorists, Theodor Adorno chief among them, “generally find it extremely hard to describe the relation of musical form (or the internal logic of music's formed-content) to political ideals and social relations,” but this inherent
challenge “does not undermine their conviction that some such relation exists.” I believe that this relationship does exist, and more concretely than the less material “expressing, mirroring, crystallizing, encoding, enmeshing,” which Goehr critiques. Even—perhaps especially—within music that purports not to contain any superficial, programmatic agenda, composers engage with a historical musical dialogue by dint of the structural forms they use, modify, or reject; the instruments for which they write, and how; the references they make; even the formatting of individual notes on the page.

To support this constructivist theory of art music, this paper employs a distinctive, innovative analytical method which takes advantage of the parametric diffraction that occurs in rearrangements of works for new performing forces. A comparison of the original piece and the new arrangement is quite effective at demonstrating the discrete musical and cultural values that each embodies, especially when they belong to different composers and are separated by a generation or more. This mutual authorship can engender a unique clash of values caused by an interpersonal or interregnal discrepancy between opinions about how listeners should receive a piece of music, and in what way meaning is transmitted through the manipulation of formal musical parameters.

Broadly, I refer to this diachronic practice as recomposition, or the appropriation of prefabricated musical materials into a new work. Recomposition is most useful as a descriptor for pieces which place themselves paratextually in the lineage of the piece they recompose. The word “arrangement” is more popularly used

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to describe such a move, but I would argue that recomposition is more precise, since it does not preserve, note for note and sound for sound, the entirety of an original work in a new version for a variable medium. Though this preservation may be the partial goal of the recomposition, it is an ill-fated one. Recompositional strategies must be used by the composer and the performer in order to shoehorn, for example, what was once a pianistic phrase into a figure for violin. In other words, the manipulation of musical parameters is required in the process of shifting material between media. Given that a new arrangement will involve some sort of mensurable change in one or more criteria—for example: global or internal temporal proportions, quality of individual expression, augmented or modified timbre, and orchestrational texture—these modifications can be contrasted with the properties of its original object of focus in order to reveal a difference of agenda between the two.

In manipulating musical parameters, recompositional projects let slip their artistic priorities. They must define their own extra-musical function in contraposition to that of their original object, thereby defining what they view as that object’s own function. Analysis of recompositions can also shed light on the ways in which the original piece’s function has changed or been reinterpreted in a new sociocultural light, beyond the purely musical. Even a work that remains doggedly faithful to the original, such as the Arditti Quartet’s recording of Nancarrow’s Study no. 33, will always present some minute, but no less significant, divergences to be analyzed. The sheer fact of the two pieces’ uncanny homology, and the extraordinary lengths to which the latter’s arranger and performers must have gone to achieve it, may also provide fodder for aesthetic and trans-historical commentary.
To begin, I place Goehr’s own theory of the formation and retroactive framing of *Werktreue* alongside Theodor Adorno’s Marxian armchair musicology, Peter Bürger’s reflections on the avant-garde, and Robert Fink’s link between musical and societal teleology. These theoretical devices route the metaphor of musical form through more literal paramusical elements that can clarify its relationship to societal constructs. The second chapter will look at the Bang on a Can All-Stars’ interpretation of Brian Eno’s *Ambient 1: Music for Airports*, a project which subverted Eno’s intentions for ambient music, his brainchild. The third chapter discusses live arrangements of Conlon Nancarrow’s player piano studies, which substitute human expression and imperfection for mechanical fireworks. Both of these are case studies of recompositional projects that recontextualized their object’s original function, mutually revealing a new depth of musical and social meaning.
Chapter One

Teleology and recomposition in modernism and the avant-garde

Despite frequent worrying among composers about sounding unintentionally derivative of one another, Western classical music is inherently self-referential. Though most hypertextual allusions are of a more opaque, stylistic nature, the most transparent way to cite a musical forebear is to quote their work directly. Some composers even endeavor to rewrite a piece completely and update it to a contemporary style. This practice has its roots in longstanding traditions of knowledge transfer via apprenticeship dating back to Western music’s prehistory. Techniques as specific as recomposing an entire work and as vague as conforming to a broadly utilized formal structure each demonstrate historical progression both by allowing works to reflect each other as well as defining their marked distinctions. The latter divergences between pieces are critical to piecing together the progressions of musical thought that led to the disparate movements of musical modernism and the differently radical avant-garde. Philosophers have taken a particular interest in this forked chain of inherited influence, which many have extrapolated to broader theories of the social.

The artistic happenings of the early twentieth century in Western Europe prompted broad philosophical reflections on the trajectory of genre categories, aesthetics, and their strained relationship to the established musical institution. After concluding a section of Aesthetic Theory by arguing that modernity has rendered the theatrical categories of tragedy and comedy completely redundant, Theodor Adorno begins his next chapter with a bold statement on the fate of all genre categories in the twentieth century. The blurring of lines that “befell the categories of the tragic and the
comic testifies to the decline of aesthetic genres as such,”⁴ he claims, referring to the “total process of nominalism’s advance” which eroded Platonic universals in favor of categorizations based on more immediate references. Despite Adorno’s commitment to the historical materialist metanarrative, his acknowledgment of this purported historical trend seems to be pointing to the beginnings of postmodernism. Adorno qualifies this inconsistency by referring to Croce, the first theorist to apply a Hegelian dialectic to a recognition of this encroaching nominalism. Adorno critiques his call for art to be received “on its own merits” in place of comparison with universal forms.⁵ Instead of completely dismissing the universal, Adorno recognizes its aesthetic tug of war with the particular. When he states that “The substantial element of genres and forms has its locus in the historical needs of their materials,”⁶ he reaffirms the artistic telos which, he believes, leads inexorably to the fulfillment of “authentic forms.”⁷ This rise of the particular, which “originates in the universal,” allows the “radical elaboration of individual works,”⁸ thus threatening the ability of “objective” forms to see themselves to completion in fulfillment of their own strand of the grand modernist narrative. However, this threat of nominalism “does not originate in reflection but in the artwork’s own impulse, and to this extent it originates in a universal of art.”⁹ In other words, the splitting off from established forms only serves to reaffirm the Platonic form and develop it further.

⁴ Theodor Adorno, Aesthetic Theory (London: Continuum, 2002), 199.
⁵ Ibid.
⁶ Ibid., 200.
⁷ Ibid., 201.
⁸ Ibid.
⁹ Ibid.
Adorno is not shy about his normative judgment that the modernist narrative must be carried through in order to “revolutionize musical material”—just as Schoenberg, voluntarily or not, “continued Beethoven’s reflections on how quartets should be written”—and he actually welcomes the splintering of direction that he witnesses in the present milieu. He justifies this by asserting that “The existence and teleology of objective genres and types is as true as the fact that they must be attacked in order to maintain their substantial element,” thereby aligning developments in musical form with both a broader musical narrative and, ultimately, the reciprocal base-superstructure relationship of the Marxian societal project to which Adorno subscribes. In this way, for Adorno, musical teleology has everything to do with societal teleology.

Adorno humors Croce when he submits that “Probably no important artwork ever corresponded completely to its genre,” thus reaffirming the necessity of the genre itself as a point of departure. The repeated example throughout this section is of Bach’s fugue writing, from which the “academic rules of the fugue were derived,” yet Bach’s work frequently breaks the “rules” which were derived in part from, paradoxically, his own corpus. Thus, according to Adorno, Bach’s fugal forms unwittingly dialogue with the archetypal fugue using an ephemeral stroke that theoretical analysis cannot quite pin down. He argues that composers engaging with such universal forms “themselves were in no way conscious” of the aesthetic discourses and mechanical rules they had at their intuitive disposal. They utilized

11 Ibid.
12 Ibid., 199.
13 Ibid., 200.
these conventions—transmitted implicitly via study of whatever past and contemporary repertoires were available at the time—not as a wary expression of an overarching design, but as the only tools they had been given to ply their trade. The practices were only codified retrospectively according to academic corpus analyses well after the fact.

In a study of Renaissance-era musical imitation, Howard Brown provides evidence that “Emulation—using models to guide a student's initial efforts until he has mastered his craft—may well have been as basic a principle of musical pedagogy in the sixteenth century as it is now.”¹⁴ This intellectual apprenticeship to the past was particularly necessary since “treatises on free composition that tell the budding composer precisely how to go about his craft […] are rare throughout the history of Western European music.”¹⁵ This predominantly literal tradition of knowledge transfer maintained recomposition as the driving force of Western musical history through its transformation from a mostly pedagogical device to a fully appropriable tool of artistic commentary with, approximately, the turn of the twentieth century and the rise of postmodernism.

I would suggest that this historical trajectory is bound up with the development of large-scale musical form itself. Though Bach was not aware of what Adorno labels as his position within the drive towards the universal, he certainly had codified ideas about what a fugue consists of and how it is distinct from other forms. Beethoven, often at the behest of his publisher, named many of his symphonies,

¹⁵ Ibid., 10.
superimposing onto them a vaguely representational agenda, but he remained firmly and primarily in dialogue with symphonic form. The widespread adoption of openly programmatic music, spurred in the mid-nineteenth century by Liszt and Berlioz, kickstarted a strain of departure from the yoke of the drive to fulfill the universal via the metonym of the symphony. *Symphonie fantastique* prefers to tell a story in musical collage, paratextually augmented by detailed program notes, rather than engage directly with its symphonic predecessors. Each of its five movements retains an individual teleology, but the symphonic arc is dictated by Berlioz’s superimposed narrative, united by the *idée fixe* which frequently reappears. The symphony closes with a polystylistic set of variations on the “Dies irae,” choosing to both denote and connote death. Berlioz intended to use form to tell a story other than merely that of the symphony’s historical trajectory.

The Romantic-era trend of aestheticism that began with Beethoven’s prodding of the formal envelope may have peaked with the indulgences of Gustav Mahler. Though demonstrably beholden to restricting containers like sonata form and the macro design of the symphony, Mahler let his cyclical themes run wild across entire works, operating on a blown-up timescale theretofore unprecedented even in other cyclical symphonic writing. In the popular style of the late nineteenth century, Mahler gave his first few symphonies programmatic bases. However, he formally withdrew these notes within several years of their publication, which suggests that the critical narrative development in the late nineteenth century was not the superficial program,
but its subtextual appropriation of theretofore unrelated structural devices.\textsuperscript{16} In my reading of Peter Bürger’s \textit{Theory of the Avant-Garde}, the author positions this complication of artistic forms as the development which led to the self-awareness of twentieth century artists and their use of historical forms as freely appropriable artistic tools.

Bürger doesn’t want to view history as merely a “prehistory of the present.” Rather, he augments historical perspective with “insight into the nexus between the unfolding of an object and the categories of a discipline or science.”\textsuperscript{17} He bases this correlation on Marx’s observation in the \textit{Grundrisse} that “the possibility of a progress in knowledge is a function of the development of the object”\textsuperscript{18}, in question. As an example, Adam Smith’s insight that “it was not a specific form of labor but labor as such that created wealth”\textsuperscript{19} was only possible after the industrial revolution, when agriculture was replaced by many diversified vocations as the capital-producing occupations of the proletariat. Bürger extends this theory of labor to the arts, pointing to the self-indulgent, detached tendencies of aestheticism as the catalysts of the unfolding that led to the rise of the self-aware historical avant-garde. In a note, he clarifies that this term refers primarily to Dadaism, early Surrealism, and the post-Revolution Russian avant-garde, all of which “do not reject individual artistic techniques and procedures of earlier art but reject that art in its entirety” as a manner

\begin{flushright}
\textsuperscript{16} In an early approximation of what Robert Fink calls recombinant musical teleology, to be discussed later.
\textsuperscript{17} Peter Bürger, \textit{Theory of the Avant-Garde} (Minneapolis: University of Minnesota Press, 1984), 16.
\textsuperscript{18} Ibid., 17.
\textsuperscript{19} quoted in Bürger, 16.
\end{flushright}
of critiquing “art as an institution such as it has developed in bourgeois society.”\textsuperscript{20}

For Bürger, this is the fundamental distinction between the aims of modernism and the avant-garde. The former is born of intra-artistic critique, while the latter rejects the institution of art as a whole, cleaving off its elitist aesthetic, cultural, and political mechanisms in pursuit of an art that engages with the reality which contains it. This is a rejection of “a specific kind of unity, the relationship between part and whole that characterizes the organic work of art”\textsuperscript{21} in which “the parts have a significantly larger autonomy vis-à-vis the whole.”\textsuperscript{22}

Bürger and Adorno don’t see eye to eye about the uses of the metaphor of musical teleology to describe and influence society. In an extensive treatise on Mahler, Adorno compares his work to the trajectory of the European novel, both calling his omnipresent themes “recognizable, like characters in a novel”\textsuperscript{23} and his underlying forms “modeled on the novel rather than on the epic.”\textsuperscript{24} In \textit{Aesthetic Theory}, Adorno holds up the novel as prototypical of the nominalistic individuation of form. Mahler’s oeuvre does not merely narrate, but “the composer wants to make music in the way that others narrate.”\textsuperscript{25} There is an externality to the late Romantic symphony; a subtle appropriation of something that lies outside the insular form to which the long-scale development of the symphony is supposed to lead. In a later essay extolling the work of Arnold Schoenberg, Adorno argues that “the entire façade

\textsuperscript{20} Bürger, \textit{Theory of the Avant Garde}, ch. 2, note 4.
\textsuperscript{21} Ibid., 55.
\textsuperscript{22} Ibid., 84.
\textsuperscript{24} Ibid., 68.
\textsuperscript{25} Ibid., 62.
of the music of the last two-hundred years is submitted to productive criticism” and “the idiom is neutralized”\textsuperscript{26} through the work of the Viennese atonalist. Contrary to the outward facing work of Mahler, Schoenberg is able to “realize total enlightenment in himself, regardless of the cunning naïveté of the culture industry,”\textsuperscript{27} his polar opposite, which churns out generic, 32-bar trash in order to mollify the ears of the proletariat.

Bürger criticizes Adorno—and, by association, Schoenberg—for taking serialism’s self-contained autonomy for granted, disregarding the social function—as in, the “sense of subjection to the reified aims of bourgeois life”\textsuperscript{28}—of the music. Bürger summarizes this position as conceiving of art as “a social realm that is set apart from the means-end rationality of daily bourgeois existence.”\textsuperscript{29} Adorno figures that if high art is to be the property of anyone, it belongs to the bourgeoisie. Therefore, removing it from the ideological grasp of everyone, by setting free “the familiar categories of musical structure, like theme, elaboration, tension, [and] resolution”\textsuperscript{30} is the best possible way to express the broadly alienating effects of late capitalism. According to my reading of Bürger, if Adorno’s analysis is correct,\textsuperscript{31} Schoenberg’s work would represent a quintessentially modernist attitude towards the tradition of form, but does not qualify as avant-garde since it fails to criticize the indulgent, cyclical, and self-congratulatory institution of classical music as a whole.

\textsuperscript{26} Theodor Adorno, \textit{Prisms} (Boston: The MIT Press, 1983), 154.
\textsuperscript{27} Theodor Adorno, \textit{Philosophy of New Music}, edited by Robert Hullot-Kentor (Minneapolis: University of Minnesota Press, 2006), 16
\textsuperscript{28} Bürger, \textit{Theory of the Avant Garde}, 10.
\textsuperscript{29} Ibid.
\textsuperscript{30} Adorno, \textit{Prisms}, 152.
\textsuperscript{31} Which it may not be—this “setting free” needs further investigation.
In the case of tonal hierarchy and some elements of teleology, it attempts to remove itself completely, which can be read as an inherent criticism or a natural extension of pre-existing cracks in the surface of tonality. However, in the cases of texture, timbre, and socioeconomic function, Schoenberg’s music brings little novelty to the table.

Adorno’s lionizing of Schoenberg fails to apprehend the entirety of the way in which elements in the work of Schoenberg and the entire Second Viennese School remain very much within the universal narrative of European art music. Radical though their compositional innovations may be, neither Schoenberg nor Mahler ever wrote a piece for anything other than the same Western classical instruments used since their invention by their European forebears.\textsuperscript{32} Though theme, elaboration, tension, and resolution might be gone—or, rather, unrecognizably altered, the music’s form propelled by the completion of the aggregate tone row instead of an authentic cadence—the very sounding of the music by an ensemble such as the string quartet places it in implicit dialogue with the classical tradition. Even an innovation such as the instrumentation of \textit{Pierrot lunaire}, in which flute, clarinet, violin, viola, and piano accompany a sing-talking soprano, requires highly competent, classically-trained players to execute it as written in the staff notation. Also, before conceiving of twelve-tone technique, Schoenberg already enjoyed a level of prestige bolstered in large part by his vocal championing on the parts of both Mahler and Strauss, themselves giants in the field. These pre-existing alignments with the established institution make the process of reappropriating Schoenberg’s semi-radical work back

\textsuperscript{32}Admittedly, one medium-related novelty in \textit{Pierrot} is the soprano’s altered \textit{Sprechstimme} technique, which Schoenberg invented for Albertine Zehme. The Mahler box of the Symphony No. 6 also comes to mind as a novel extension of existing sonorities.
into the classical canon quite a simple one. Today, atonal works of the Second
Viennese School are presented alongside both earlier and later works in the Western
art music repertoire, arguably destroying any revolutionary character the music might
have retained. Its function is bourgeois edification in the form of a slightly titillating
addition to a concert program.

In addition to the static instrumentation upheld as an immutable tradition
among European modernists, these composers leave the highly developed work-
concept, or Werktreue, mostly unchallenged in their repertoire. Lydia Goehr defines
this as “a specific crystallization of ideas about the nature, purpose, and relationship
between composers, scores, and performances” which enshrines works of art music as
discrete objects, undeviating from the contents stipulated by each score.\footnote{Lydia
Goehr, \textit{The Imaginary Museum of Musical Works: An Essay in the
Philosophy of Music}, (Oxford: Clarendon, 1992), 253.} The
transition of the musical artwork from a craft-oriented, productive performance to a
Romantically-conceived object, “a permanently existing creation” in a “metaphorical
museum”\footnote{Ibid., 174.} allowed it to engage with the unrestricted market of cultural capital,
posited by Bourdieu,\footnote{Pierre Bourdieu, \textit{The field of cultural production: Essays on art and literature}
(New York: Columbia University Press, 1992), 34.} as a token of artistic merit subject to the same type of
reception and criticism as works of fine visual art.

The development of Werktreue also resulted in an ex-post-facto redefining of
pre-Classical works—originally conceived as exercises of craft to fill a functional
need—in an anachronistically Romantic manner, despite the historical incongruence
of this perspective. The identification of Werktreue in pieces from the pre-Werktreue
era is made possible by shared paratextual signifiers that allow contemporary
musicians to “identify composers, represent the music in adequate notation, [and]
specify determinate sets of instrumental specifications” in earlier pieces they choose
to conceive as works. 36 Goehr suggests that pre-nineteenth century composers were
generally bereft of modern intellectual property concerns and often utilized musical
materials which they had not originated. In particular, Handel was well-known for his
frequent “polishing” of others’ original themes. 37 This pre-Werktreue pragmatic
application is one possible use of recomposition, which always seeks to
recontextualize an extant work. However, both the means and ends of its techniques
can vary considerably.

Whereas pre-Romantic composers utilized recomposition as a matter of
acceptable convenience, employing “significant overlap and repetition of musical
material,” not just “within a single composer’s output, but among compositions by
any number of composers,” 38 Joseph Straus suggests that twentieth century
recompositions of Bach works by both Schoenberg and Webern are responding to
Bach as an “intimidating godlike figure, enshrined in the canon” by “reinterpreting
the past to avoid being crushed by it.” 39 Goehr might see these recompositions as both
derivative affirmations of the Werktreue-inflected reification of Bach’s opus and an
assertion of these composers’ position either within or against that noble lineage. At
their core, composers who self-conceive as executors of Werktreue consider

36 Goehr, The Imaginary Museum, 255.
37 Goehr, The Imaginary Museum, 184-5.
38 Ibid., 182.
39 Joseph N. Straus, “Recompositions by Schoenberg, Stravinsky, and Webern,” The
Musical Quarterly 72, no. 3 (1986), 302-3.
themselves *serious* composers who, by definition, are responding to some formation of Western teleology—using or negating harmony, structure, and history. As Bürger reacts (indirectly) to Schoenberg’s incomplete detachment from his institutional environs, so can recompositions and other derivative works be analyzed according to their dialogue with their objects of focus.

When Beethoven arranged his own Piano Sonata no. 9, op. 14, no. 1 for string quartet, he did so at least partially as a statement about what he perceived as sloppy, avaricious transcriptions of other pianistic works for the lusher medium of a string ensemble. In an 1802 letter to his publisher, Beethoven insisted that only the composer himself should take on such a task, “not only because whole passages need to be altered, but one must also be able to add things, and for this one must either be the composer himself or have a similar outlook.”

Goehr references Beethoven’s insistence on clean and accurate transcriptions in the aid of recomposition, proposing that that when “we confront such imperfectly complying examples, we do not exclude them from falling under the work-concept.” Even though he disliked the practice—which was, at the time, shrewdly entrepreneurial by nature, and often prioritized parsimony over meticulousness—Beethoven recognized even the shoddiest of transcriptions as inherently derivative of its original, thus reaffirming the status of the original as a codified, reproducible object. Thus, though recomposition often serves to

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Moreover, it seems that Beethoven may have originally intended this sonata for strings—see Broyles, “Beethoven's Sonata Op. 14, no. 1, Originally for Strings?,” *Journal of the American Musicological Society*, Vol. 23, no. 3 (Autumn, 1970), 405-419.

reaffirm the Werktreue of the original, it also leeches off the original’s aura.

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Scholars continue to elaborate the metaphor of musical structure in relation to society well into the twenty-first century. In “The End(s) of Genre,” Eric Drott posits a spectrum of genre designations between large-scale, “agonistically defined” categories, and “the manifold genres, subgenres, and sub-subgenres that proliferate in response to the demands of artistic and social distinction.” As Goehr describes within the framework of Werktreue, any given work or artist can and does fall into a number of concentrically arranged buckets, beginning with the broadest art vs. pop distinction and working inwards to the most aesthetically specific and exclusive of groupings. Drott clarifies that “broad and narrow categorizations can coexist, even if this coexistence is marked by friction.” He briefly touches on the broad category of dance music, under which such stylistically disparate works as the “Blue Danube” waltz and Donna Summer’s “Love to Love You Baby” coexist. Though Drott seems to dismiss this shared characterization as unhelpful, I think this cross-sectional classification remains useful in pinpointing the intended or eventual function of the music. Functional—that is, political—analysis, in turn, may point to unexpectedly shared aesthetic signifiers.

To elaborate on Drott’s tongue-in-cheek dance music comparison, Strauss’s seminal waltz does share a non-coincidental set of characteristics with “Love to Love You Baby” which are indicative of their mutual purpose. In general, ‘70s disco and Viennese waltz both contain a series of repetitive rhythmic phrases in predictable

43 Drott, “The End(s) of Genre,” 11.
hypermetric formations. There is consistent, accented emphasis on the strong beats of each barline (albeit, in different time signatures) to aid dancers in placing their feet according to a preconceived pattern of motion. The construction of each tune has this loosely prescribed dance style in mind, for which it has optimized its tempo and feel. Because of the functional implication shared by both works, their public reception has as much to do with their danceability as with their individual musical features. Certainly, both can be listened to in near-total physical stillness, but to do so is to remove the musical object from at least one of the purposes—perhaps the primary purpose—for which it was designed. In this way, functional genre groupings such as “dance music” are created by the production and reception of their constituents.

This is not to say, of course, that the respective works of Strauss II and Summer/Moroder carry the same cultural weight. Though ballroom and disco dancing are rhythmically comparable, their vast timbral discrepancies render them irreconcilable at the cultural level. Even though the “Blue Danube” is considered light classical fare at best, the crowd-pleasing fodder of pops orchestras, the matter of its orchestral instrumentation alone conveys to audiences a dignity not possessed by the party-oriented sound of the disco record.

Viennese waltz in the 1860s may be practically irreconcilable (at least, tastefully) with disco’s open appeal to the sensual, but disco may have more immediate functional ties with another repetitive music born in 1960s downtown New

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York. Drott suggests “Love to Love You Baby” as a pioneering representative of disco as a whole, but the choice of this song is convenient due to the close relationship Robert Fink draws between its extended dance version and the pulsing minimalism of Steve Reich’s *Music for 18 Musicians*. These musics share more than just a bout of commercial success around 1976 and an easily danceable (either in the club or on stage) groove. While acknowledging and preserving their vast (sub)culturally discursive distinctions, Fink ties the “recombinant teleologies” of disco and minimalism together by nicknaming the tunes “Dance Party for 18 Musicians”45 and “Love to Love You—Through Gradual Process—Baby,”46 pointing out the startling similarities in form, function, reception, and chronology of these mass-culture phenomena. The joint analyses are structured in symbiotic opposition; according to Fink, “reading disco through minimalism […] will allow the analyst to focus dispassionate attention” on the form of Summer and Moroder’s work, disregarding the “morass of race-and-gender inflected essentialism” to which its assigned genre is susceptible.47 Simultaneously, “reading minimalism through disco will help banish the lingering puritan and ascetic strains in the reception of joyously physical works like *Music for Eighteen Musicians*,”48 digging into minimalism’s “libidinal realities” in parallel to Donna Summer’s overtly hypersexual affect. Ultimately, both musics eliminate the finite “drive” from tension to resolution from which their musical predecessors—rock and Beethoven, respectively, if you’ll permit

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46 Ibid., 55.
47 Ibid., 30.
48 Ibid., 31.
some historical indiscretion—derive their structure. The jouissance is in the endless repetition of the closed circuit rather than the “emphatic tonal closure” of a perfect authentic cadence in the finale.

A straightforwardly poststructuralist analysis might argue that, in subverting linear musical teleology, both disco and minimalism achieve a break with an oppressive Western discourse which has been in development since the Middle Ages and before. However, Marx himself reminds us that the conditions of capitalism are present in the relations of production which inform all social relations. In line with my earlier Bürgerian analysis of Schoenberg, I would ask: do either of these musics successfully break with the institutions surrounding their conception? As the emergent figureheads of minimalism, both Steve Reich and Philip Glass achieved a level of pop culture recognition and crossover success theretofore unprecedented for almost any classically trained composer. Music for Eighteen Musicians sold 100,000 copies by the end of the ‘70s, an anomaly for new classical music, and, somehow, was named to the top 10 pop albums of 1978. Glass “was playing occasional keyboards for Polyrock, a New York post-disco band,” and would eventually collaborate with and recompose iconoclastic pop star David Bowie. Minimalism started to sell like pop music and, at certain points, became inextricable from it. And yet, the transposition of a music with origins in the experimental

49 Karl Marx, Capital, Vol. III, ch. 48, iii.
50 Other shockingly well-selling premiere recordings of the era include George Gershwin’s Rhapsody in Blue, Henryck Gorecki’s Symphony no. 3, “Sorrowful Songs,” and Benjamin Britten’s War Requiem, though none were entirely as novel as Music for Eighteen.
51 Fink, Repeating Ourselves, 26.
52 Ibid.
downtown scene to the midtown concert hall—even by Juilliard-trained composers—was not a seamless one. Bear in mind that the infamous riot during a Carnegie Hall performance of Reich’s 1970 composition *Four Organs* took place just five years before the successful release of *Music for Eighteen Musicians*. This was music which a particular audience deemed so functionally inappropriate for the concert stage that they attempted to silence it.

The above is a demonstration of a music that challenged many aspects of the classical institution in teleology, harmony, instrumentation, and function through the late twentieth century. It, too, was selectively reappropriated—and eventually recomposed—via the classical canon, a process that was made possible in large part by the traditional notation which belied its composers’ elite institutional education. Both Reich and Glass are regularly performed in major halls around the country, and their concert work is rarely presented outside of such illustrious venues. In the highest circles, their work has come to signify an imperative step in the history of Western art music instead of the vulgar disco offshoot-anomaly to which it was once compared with regularity. Glass, in particular, is frequently programmed next to and billed as a logical successor of J.S. Bach, both aesthetically and teleologically. In the program notes for a recent concert featuring the music of those two, pianist Simone Dinnerstein identified two potential parallels therein bridging more than 200 years of history. “There’s a trend to play both Bach and Glass in a motoric, mechanical away, with a strong pulse. […] Instead of it being in such small denominations, I think of a

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53 Informally subtitled “The longest V-I cadence in Western music history” by the composer.
much larger pulse. Within that there’s a lot of freedom.” The hypermeter in Glass’s piano studies to which Dinnerstein implicitly refers is, arguably, a recombinantly teleological reference to the same large-scale cadential motion present in, for instance, the preludes and fugues of the *Well-Tempered Clavier*.

Two composers separated by centuries can engage with similar strains of compositional thought and approach, by distinct routes, similar modes of institutional patronage. It follows that, inversely, to recompose a piece does not necessarily preserve its formal conceits, nor replicate its generic or political affiliations. Since the Adornian particular, as represented by musical genres and functions, has everything to do with musical parameters and empirical associations with works of a similar ilk, the analyst should not be too hasty in assuming that a recomposition recreates the stylistic effect of its original object. Instead, recompositions should be evaluated in the same way as, e.g., the Wagner quote in Debussy’s *Golliwog’s Cakewalk*. The bitonal Tristan chord, presented in a ragtime context, seeks to create an ironic, nationalistic disc(h)ord rather than pay any kind of sincere homage. The case studies that follow are examples of large-scale recompositional projects which, despite their meticulous arrangements, do completely different political work than the fixed media works they emulate.

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Chapter Two

Bang on a Can’s “Brian Eno’s Music for Airports”

Could the institution shed its conformity by adapting the work of a total outsider? Brian Eno—composer-producer-rock star, primogenitor of (or, at least, coiner of the term) ambient music, and self-described non-musician—was about as much of an outsider to the storied halls of Western classical music as one can find, until the contemporary music institution decided they would claim him as one of their own in the mid-late 1990s. Philip Glass—who collaborated with him on his David Bowie symphonies—and Bang on a Can, who brought Music for Airports into the concert hall, yearned to lease his exciting disregard for the Romantic canon and the sex appeal of his subversive former life as a glam rock frontman with an “alien-in-drag stage presence.”55 Moreover, Bang on a Can’s founding composers grew up with Eno’s pioneering record, Ambient 1: Music for Airports, which was released in the same year as Music for 18 Musicians, perhaps leading to its conflation in their minds with Reich’s minimal processes. However, cross-referencing the Bang on a Can All-Stars’ recordings of Music for Airports with the studio-composed album version demonstrates that the contemporary music ethos might not have room for the political beliefs of such a classical interloper, who wanted nothing to do with the gradual processes of his release-year-mate. In this case, I argue that Music for Airports: Live disregards Eno’s clear goals for ambient music, of which Ambient 1 was the first real entry, in order to produce a moving concert experience in the approximate image of a Romantic symphony. In demonstrating this, I draw attention to the manipulation of

specific formal musical parameters in Bang on a Can’s live recomposition and the effects that these manipulations obtain in the multifarious cultural worlds of the piece.

Brian Eno was not a trained or even self-taught musician growing up. He discovered experimental music via sound art and tape manipulation as a student at the Winchester School of Art. Eno was exposed to the work of the countercultural Fluxus movement in the mid ‘60s during his time at Ipswich Art School, where he participated in performances of George Brecht’s *Drip Music* and La Monte Young’s “X for Henry Flint.” In the late ‘60s, he became a member of both Cornelius Cardew’s hyper-political Scratch Orchestra, an organization deeply invested in Brechtian relations between art and life, and the deliberately amateur Portsmouth Sinfonia. Soon after, he kicked off a career in commercial pop production as live sound engineer and backup singer for the band Roxy Music. The avant-garde involvements led him in 1975 to co-produce *Oblique Strategies*, an experimental manifesto in flash cards, while the commercial endeavors fomented his intimate relationship to studio production, as documented in his 1979 lecture “The Studio as Compositional Tool.” In short, Eno has none of the conservatory training or institutional credentials shared by most of the New York minimalists of the same era, which already positions him as an outsider in the field. His entire musical formation is in various interrelated twentieth century experimental performance practices which,

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56 Brian Eno, liner notes to *Discreet Music*, Virgin Records, 1975.
in and of themselves, challenged convention. He delights in his inability to read staff notation.

After four critically acclaimed but low-selling solo art pop releases, Brian Eno released *Ambient 1: Music for Airports* on Polydor in 1978, the same year that Reich’s *Music for Eighteen Musicians* came out on ECM. He conceived the work while sitting in the airport in Cologne, assailed by unappealing Muzak.\(^\text{58}\) In the liner notes to the album, Eno positions his ambient music in opposition to this bland, corporate recorded sound, which usually takes the form of “familiar tunes arranged and orchestrated in a lightweight and derivative manner” created and distributed in order to “make us feel more relaxed, contemplative, [and] distracted from problems.”\(^\text{59}\) Lamenting that Muzak as it then stood “has led most discerning listeners (and most composers) to dismiss entirely the concept of environmental music as an idea worthy of attention,” Eno reclaims the label of ambient music for a type of composition that can “accommodate many levels of listening attention without enforcing one in particular; it must be as ignorable as it is interesting.”\(^\text{60}\) In the liner notes to *Discreet Music*, he cites Erik Satie’s desire to “make music that could ‘mingle with the sound of knives and forks at dinner,’”\(^\text{61}\) but extends it; instead of “regularizing environments by blanketing their acoustic and atmospheric idiosyncrasies, Ambient Music is designed to enhance these.”\(^\text{62}\)


\(^{61}\) Eno, *Discreet Music* liner notes

\(^{62}\) Eno, *Ambient 1* liner notes
Given his liner notes responding to Muzak, it doesn’t appear that Eno consciously conceived *Music for Airports* as a record designed to engage or disagree with the classical canon. Adorno, even in his hatred of easy listening, might argue that these genres’ trajectories are indirectly correlated with one another in their opposing functions and relationships with the modernist narrative. In addition to his previous nod to Satie, Eno does mention Steve Reich’s pioneering tape piece “It’s Gonna Rain” as a key influence in a talk he gave in 1996. When placed in conversation with the broader Western European tradition, this work—taking the cues it does from Reich and Satie—ruptures convention in four crucial ways.

For one, it is expressly nonteleological. In much the same way that Adorno myopically considers Schoenberg’s work to rupture classical teleology, Robert Fink hypermetropically positions the ambient work of Brian Eno—alongside the indeterminate experimentalism pioneered by John Cage—as representative of “truly nonteleological musical style.” This elusive category distinguishes it from musics, such as minimalism, to which he ascribes an altered, recombinant teleology. To elaborate on the significance of this distinction: The form of a piece firmly ensconced within a traditional Western teleology might build to a single climax—aligning with, following Susan McClary, “a basic phenomenological congruence with the way we perceive quotidian bodily rhythms.” A recombinant teleology might reveal (in the sense of Bürger) and alter this form by including continuous climaxes or other

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64 Fink, *Repeating Ourselves*, 43.
65 Ibid.
66 Ibid., 44.
“musical universes in which tension and release are pursued on a [micro or macro] scale that far outstrips the ability of the individual human subject to imagine a congruent bodily response.”67 However, a work which does not engage with formal teleology in the slightest projects no relationship whatsoever to the tension/release system.

The objects of Eno’s output which he would come to term ambient, beginning with Discreet Music in 1975, are considered generative music. They are constructed of algorithms based on tape loops of varying lengths whose relative temporal positions change at a definable rate. For example, the track “2/1” on Ambient 1 consists of

sung notes, sung by three women and myself. One of the notes repeats every 23 1/2 seconds. It is in fact a long loop running around a series of tubular aluminum chairs in Conny Plank’s studio. The next lowest loop repeats every 25 7/8 seconds or something like that. The third one every 29 15/16 seconds or something. What I mean is they all repeat in cycles that are called incommensurable — they are not likely to come back into sync again.68

These analog algorithms result in music which is both texturally consistent and infinitely variable. These characteristics are essential to Eno’s goal of creating a literal music for airports, which has to be “interruptible (because there will be announcements […] and it has to be able to accommodate all the noises that airports produce.”69 An music that employs some sort of linear teleology, which relies on individual parts building to a cogent whole, cannot be interrupted without losing some of the critical information it contains in building its “argument,” as it were.

However, in “2/1,” as Eno himself claims,

67 Ibid.
68 Eno, “Generative Music.”
69 Eno, A Year With Swollen Appendices (London: Faber and Faber, 1996), 314.
As the piece progresses, what you hear are the various clusterings and configurations of these six basic elements. The basic elements in that particular piece never change. They stay the same. But the piece does appear to have quite a lot of variety.

The original recording of “2/1” only lasts about 9 minutes. However, it does not build to a climax or any sort of foreseeable event during that time. In fact, left to its own devices whirring away in the studio, “2/1” could last close enough to forever without repeating itself as makes no difference. Eno’s final role in this and many other recordings of his generative work is curatorial, selecting the excerpt to be memorialized on tape as representative of the broader formula from which it originated.

Nine minutes is a fairly standard length for a piece released on a vinyl disc. The first side of *Ambient 1* is about 26½ minutes long. Eno states elsewhere that the longest piece he could record on one side was 31 minutes long. These figures represent very literal compositional restrictions presented by the limitations of recording technology in the mid-twentieth century. However, it was the studio itself that allowed Eno, and Reich before him, to create these works. The availability of writable tapes and other recording technologies exploded the available sonic vocabularies of individual composers or producers. Eno himself describes the power of the studio:

> In a compositional sense this takes the making of music away from any traditional way that composers worked, as far as I'm concerned, and one becomes empirical in a way that the classical composer never was. You're working directly with sound, and there's no transmission loss between you and the sound - you handle it. It puts the composer in the identical position of the painter - he's working directly with a material, working directly onto a

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70 Ibid.
substance, and he always retains the options to chop and change, to paint a bit out, add a piece, etc.\textsuperscript{71}

Though the limitations of music distribution have lessened exponentially in the intervening decades, Eno continues to delineate the finite bounds of his generative releases, even when distributed digitally. His most recent, \textit{Reflection}, lasts 65 minutes on tape. But, a novelty: one can purchase (for a considerable sum) an app on the iOS mobile platform which elaborates the entire, unending system. Leaving the price point aside, it’s clear that Eno wants (some) people to be able to experience his generative work at whatever length they want.

Despite their arbitrarily fixed nature, the pieces on \textit{Ambient 1} still buck the constraints of the work-concept, unable to reveal their unbounded potential within the confines of a record. \textit{Ambient 1} was designed completely within the studio using techniques of tape manipulation, a medium which usually harbors no aspirations of live performance. Though recorded music emphasizes reproducibility and portability in contrast to the rare and special circumstances of a live concert, a generative app democratizes the listening experience. It allows each listener to experience their own unique yet undistinguished copy of the work. There is even an ambitious JavaScript programmer who has put together a tutorial for creating your own version of “2/1” in your web browser from scratch, exploiting the exact same processes that Eno invented.\textsuperscript{72} Nevertheless, iPhones and apps and web audio were completely inconceivable at the time of \textit{Ambient 1}’s release, so a shard of aura seems to remain imbued in each delimited track.

\textsuperscript{71} Eno,”The Studio as Compositional Tool.”
The generative concept also wreaks havoc with the application of Goehr’s *Werktreue* to the in-field reception of Eno’s opus. A piece that by nature has no clear ending, that may not even progress in the same manner each time it is played, overflows the bounds of what it means to ascribe a work to a composer. How can a work be studied and reproduced if its score was created graphically, after its sound was brought into being? Moreover, if each moment is not carefully honed by the composer, left instead to its own devices, it becomes somewhat more difficult to argue that he retains full creative credit in the Wagnerian *Gesamtkunstwerk* sense. Still, *Ambient 1* retains a sliver of *Werktreue* connotation due once again to its placement on a finite record. Eno acknowledges his own curatorial instincts in a Pitchfork interview where he admits to stitching two “takes” together, with “quite a bit of jiggery-pokery,” to create the final version73 of *Reflection*, and we may assume that, out of necessity, similar liberties were taken with the recordings on the *Ambient* series.

In this sense, though the unlimited version exists beyond his total control, the pressed version of *Ambient 1* does facilitate a clear measure of identification with Eno as composer. As Cecilia Sun points out, Eno seems to be aware of this inevitable alignment with tradition and somewhat undermines it paratextually by naming Robert Wyatt and Rhett Davies, the two pianists sampled on “1/1,” co-composers of that track.74 Though this is merely a superficial consideration without much impact even

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upon close analysis of the album’s written artifacts, it belies to me that Eno was interested in subverting Werktreue, even slightly, at the time of the album’s release. He did not want sole compositional credit for the pianists’ improvisations—would he take credit for a borderline-ineffable mathematical process which he instantiated without being able to comprehend its full effect? Sun also notes that the track names correspond explicitly to their position on each side of the record and make no reference to the traditional four-movement structure of, say, a symphony.

Lastly, and most crucially, Eno very clearly suggests that Ambient 1 is not music to be listened to within a concert hall or any sort of traditional performance setting. This is music with several distinct purposes: to be interruptible by announcements and other sonic airport accoutrements, “it has to work outside the frequencies at which people speak, and at different speeds from speech patterns (so as not to confuse communication); and “to accommodate many levels of listening attention without enforcing one in particular.” 75 The emphasis here is not on the content or its delivery, but on the effect it has on the listener. Essentially, if Ambient 1 manages to “make you say to yourself, ‘Actually, it's not that big a deal if I die,’” on your flight, it will have accomplished its primary objective. 76 Though the troubling philosophy of this motive has been criticized artistically by contemporary ambient group The Black Dog, who released Music for Real Airports in protest of Eno’s deference to the idealistic prerogatives of airline companies, it nevertheless roundly defeats the notion of self-referential and otherwise functionless music. In fact, it invents a totally novel function for itself.

75 Eno, Ambient 1 liner notes
76 Eno, A Year with Swollen Appendices, 326.
The Bang on a Can All-Stars rewrote this function, weaving an entry into musical and historical telos with a recomposition of Eno. This collective of virtuosic instrumentalists formed several years after the first Bang on a Can Marathon in SoHo. Composers Julia Wolfe, Michael Gordon, and David Lang organized the debut of that mammoth concert of contemporary works in 1987 “in order to break down the barriers that separate musical communities […] Instead of sorting music by style, genre, or venue, it would be more powerful to group music by innovation, finding the rebels in each musical community.”77 The All-Stars, whose core constituency is comprised of piano, electric bass, electric guitar, percussion, cello, and clarinet, were brought together in 1992. Their instrumentation has become a sort of post-minimal, new-wave Pierrot ensemble trope, challenging the conventions of both classical and pop with instruments from either side of the aisle. The group boasts a “massive repertoire of works written specifically for the group's distinctive instrumentation and style of performance” which, their bio claims, has allowed the All-Stars to “become a genre in their own right.”78 Their repertoire list is a veritable Rolodex of established and rising names in new music, and the commissioned pieces are generally scored in staff notation. Despite the pop-inflected signifier of their instrumentation, the All-Stars are highly trained classical musicians through and through.

In 1998, the All-Stars released a recording of Eno’s work called simply *Music for Airports* without the *Ambient 1* designation. Each movement of the original was arranged for real musicians—the All-Stars plus a supporting cast of additional voices,

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77 Bang on a Can website, “Bang on a Can Marathon.” Via http://bangonacan.org/bang_on_a_can_marathon
78 Bang on a Can website, “Bang on a Can All-Stars.” Via http://bangonacan.org/bang_on_a_can_all_stars
woodwinds, brass, strings, and pipa—by a different member of the Bang on a Can collective. Gordon, Lang, and Wolfe tackled the first three, respectively, and All-Star clarinetist Evan Ziporyn put his own spin on “2/2” in collaboration with pipaist Wu Man. With the exception of “2/2,” which embellishes considerably, the arrangements themselves are based on what sound like almost note-for-note transcriptions of the original. Since its studio release and initial reception in 1998, the band has condensed the arrangements back down into a manageable endeavor for just its six core members with the help of synth samplers and a click track. In 2008, they released a recording of this reduced version, *Music for Airports: Live*. This is in contrast to the 1998 release, each movement of which was recorded in one take onto analog tape, but which at times audibly relies on studio effects.

In both cases, the most salient difference between Eno’s original and the recorded BOAC interpretation (aside from temporal considerations, a few altered notes, and Ziporyn’s massive extemporizations on “2/2”) lies in the timbral differences between the works. Eno’s tape loops on “1/1,” for example, were assembled “out of tape he had made of pianists who had played out of sync because they could not see each other”79 from different rooms in the studio. The composer time-shifted and otherwise timbrally manipulated these excerpts to sound softer and warmer, and then looped and layered them mechanically. Each repetition of a loop sounds precisely the same in and of itself, but occupies a unique position relative to other loops. By contrast, though BOAC goes to some lengths to mute and alter the sounds of their instruments to match the recording as best they can, they do not

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79 Sun, “Resisting the airport,” 154.
attempt to hide and even emphasize the individually human quality of expression achieved by playing this piece with a dozen musicians. Vibrato in the strings and winds and variable attacks in the rhythm section plainly demonstrate the humanity of the players in each articulated note.

Even constrained by a click track on the recording, there exist rhythmic liberties that are the hallmark of classically trained players who have been interpreting the notes on the page liberally in their own styles since they began playing. Especially at Ambient 1’s somber, reflective tempi, the impulse to “express” is difficult to resist. BOAC doesn’t resist, though; they claim this as a laudable feature of their recording. Live performances emphasize this rhythmic expression even more, dropping the click track completely for renditions of “1/1” and replacing it with an intricate cueing system spearheaded by the group’s pianist. Percussionist David Cossin says that removing the click track from the piece adds to the sensation of playing it as one would approach any chamber music, letting it “grow a lot more than what’s on the page” and become “orchestral and romantic” to the point where “the juices are flowing, and no one’s keeping time” precisely. Live performances of “1/1” tend to leave extra space at the ends of phrase cycles, where players tend to coordinate together to begin anew instead of counting accurately within the established time. Cossin says that he aims to replicate this sensation even while confined by a click track in the other movements. “I try to think of the click as this other instrument playing along with the group - as if there’s someone playing really solid quarter notes with me. Then I have a relationship that’s different than just this

80 Personal conversation with David Cossin, 3/19/18.
machine I have to stay with." For him, the relationship between human playing and mechanical timing is a flexible negotiation, just like any interpersonal musical interaction.

Michael Gordon calls the original *Ambient 1* “very beautiful, but very cold” as compared to a “certain tenderness” of the new version. Gordon contributed to this sentiment timbrally in his version of “2/1” by adding a scratchy break drum to his otherwise verbatim transcription, simulating the nostalgic sounds of a vinyl record, which is how he originally experienced *Ambient 1*. Goldstein hazards that this tenderness is a result of “the feeling a musician instills in a tone, especially one that lasts 10 seconds or more,” what Ziporyn calls “caressed frequencies.” The composers are quick to reassert their love for the original, but are not shy about expressing that for them, “there’s so much more depth to this version. It's literally adding human breath, so that the piece becomes a living thing.” The overall effect is such that Eno “found himself unaccountably in tears” when he first heard the recording. Evan Ziporyn told me that, though Eno was initially uninterested in the project, he sent the group a handwritten letter containing this personal anecdote as a deliberate piece of copy to use as a PR boost. Eno wanted the project, whose ethos,

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81 Personal conversation with David Cossin, 3/19/18.
83 Personal conversation with David Cossin.
84 Goldstein, “New Music for Airports.”
85 Ziporyn, in Goldstein.
86 Possibly because of his dissatisfaction with the results of the *Low Symphony* project by the same producing label, Point Music.
Ziporyn admits, was to “go with what we heard rather than whatever Eno’s concept was,” to succeed and to be heard.\(^87\)

It is not appropriate behavior to begin crying at an airport. Such an occurrence seems like it would actively induce further anxiety, rather than placate an air travel-induced fear of mortality. Eno’s tears are far from unaccountable, and Goldstein begins to pick up on the connection at the end of his article. It’s clear that Bang on a Can’s expressive micro-indulgences shifted an inherently nonteleological work back into the realm of the recombinant teleology which Fink labels as the domain of minimalism. Even though the interpretation is largely note-for-note, the musicians clearly savor each, taking it on a journey from beginning to end. Unlike the flat affect which Eno achieved with his tape loops, BOAC’s *Music for Airports* strives to engage the listener’s attention with every moment. This is a wonderful way to create an aesthetically pleasing object which affords the audience both cognitive and physiological reactions, but it has nothing to do with the original motive of ambient music. It is much more interesting than ignorable.

The liner notes to the 1998 album acknowledge the influence that *Ambient 1* had on each member. Questions about the nature of music, such as whether its home could lie “outside of the muzak of elevators and dentists’ offices and outside of the concert hall”\(^88\) served for BOAC, like many composers who came of age in the ‘80s, as “a redefinition of how we relate to music in our everyday lives.” So far, this demonstrates clear alignment with Eno’s own motives for ambient music as stated in his liner notes. In the next paragraph, the notes refer to *Ambient 1* as “music that’s

\(^{87}\) Personal conversation with Evan Ziporyn, 4/9/18  
carefully, beautifully, brilliantly constructed,” asserting that “its compositional techniques rival the most intricate of symphonies.”89 This is a curious choice of words for a group of composers and performers who, in general, seem to be reacting against the stilted, unyielding symphonic form; in fact, the visceral reactions of their aesthetic predecessors to that very form inculcated the sociomusical circumstances which allow BOAC to exist and thrive. By comparing a deliberately non-symphonic work “by a rock star calculated to be a stretch for rock listeners”90 to the ossified symphonic tradition, BOAC makes two symbiotic rhetorical moves. First, they unilaterally grant Eno the experimentalist the status of a great symphonist, asserting the Werktreue-nature of his output. At the same time, they may be sardonically denigrating the development of the symphony as a whole by claiming that Ambient 1, a composition that was crafted “for someone not to listen to”91 has all the fundamental characteristics required to label it as such. Thus, BOAC begins to claim Eno as their own great, ironic symphonist, further constructing the problematic “no-genre-as-genre” ethos of their burgeoning institutional philosophy.

In live performance, the work takes on further characteristics of a symphony. Introducing Music for Airports before a rendition at Düsseldorf Airport in 2011, Evan Ziporyn announced:

We disobeyed [Eno] and made a version for live, breathing musicians, and we’ve also disobeyed him by playing it in many concert halls. But he is happy with this disobedience. Now we are bringing it to this airport, where we join a symphony of sounds, public service announcements, and coffee machines, and a ballet of movement. So we welcome all our dancers and all our stage props and we invite you to experience them in that way or not to experience them in

89 Ibid.
90 Lang, in Goldstein
91 Gordon, in Goldstein
that way. Please don’t feel that any of these other things are an interruption to this music, and please don’t feel that we’re interrupting any of those things.

Despite the unusual surroundings and even despite his stated words, the grainy cell phone video uploaded by a fan\(^92\) depicts a patiently seated audience with its attention fixed on the stage. In between movements, they clap hesitantly. No doubt this applause is accompanied by smug silence on the part of more cultured spectators, who know that applause in the gaps between a multi-movement work serves only to out those who don’t know that it is taboo or didn’t look at the program. These are features of most any classical music concert. I also find it telling that Ziporyn did not grant express permission to the seated crowd to talk, move about, or otherwise behave as if a formal concert were not simply occurring in an unconventional setting.

Perhaps, after almost 15 years of performing the piece by that point, he knew that few would heed such a request. Satie himself, premiering parts of his “Musique d’Ameublement” in 1920 during the intermissions of a play by Max Jacob, was completely unable to coax the audience into not paying attention to the music being performed.\(^93\) As soon as the music began, they came back to their seats to observe it. Perhaps, once a public has apprehended that a display of music by a respected composer is occurring, a demand not to listen is simply a manifestation of the white bear problem of cognitive suppression.\(^94\) Or, perhaps Ziporyn regards his own Cagean rhetoric as more of a bluff, both expecting and desiring the audience’s attention. The


locus of the musical aura, after all, is in the rarified symphony concert; the famous conductor, the star soloist, the rapturous orchestra. The band didn’t fly all the way out to Europe just to be background music.

This recompositional project—rhetorically bolstered by the paratextual liner notes, interviews, and pre-concert addresses surrounding it—is not one of honoring Brian Eno’s original intentions, but of reclaiming him for the new music canon and community that Bang on a Can has systematically collocated over the course of its existence. As Goehr says of the development of Werktreue, “One way to bring music of the past into the present, and then into the sphere of timelessness, was to strip it of its original, local, and extra-musical meanings. By severing all such connections, it was possible to think of it now as functionless.”95 Stripped of its intended function, BOAC’s Music for Airports enters the performance canon as an affective, beautiful work—but, nonetheless, a toothless signifier of the ambient movement spawned by its original version.

Just as the Viennese serialists recomposed Bach to acknowledge and cement both his legacy and theirs, the All-Stars afford primo positioning to their association with Eno within their branding, restoring an aura and a work-concept to his music and taking full advantage of it. Their “landmark recordings of Brian Eno’s ambient classic Music for Airports” are the leading entry in a self-identified list of the group’s celebrated projects.96 According to Goldstein, Eno showed scant interest in BOAC’s reinterpretation until he heard it and burst into tears, or so the legend goes, but Bang on a Can’s liner notes make sure to point out that “We have had the great pleasure of

95 Goehr, The Imaginary Museum, 246-7.
96 “Bang on a Can All-Stars” via http://bangonacan.org/bang_on_a_can_all_stars
sharing the project plans with Brian Eno along the way,“97 reinforcing the reciprocal exchange of ideas and conveniently heading detractors off at the pass. By this point, the annual Bang on a Can Marathon had already commanded broad attention in the midst of a multi-year residency at Lincoln Center. In that interview with the Village Voice, the group draws parallels between Eno and Charles Ives, viewing the latter as the fundamental element in a series of American outsiders and mavericks: “Ives to Partch to Nancarrow to Reich to Monk—as much as you can say a bunch of loners make a tradition, that's a tradition I want to be part of.”98 Lang’s grafting together of outsiders here is easily reconciled with Bang on a Can’s own attempt to position themselves as “category-defying” or “a genre in their own right.” David Brackett posits that, among musicians operating in a postmodern mode, “the very denial of genre […] is itself a genre convention.”99 Elsewhere, Brackett suggests that Bang on a Can’s aesthetic and performance practice lies further within the twentieth century “remnants of modernism […] which can be felt in the BOAC pieces in their emphasis on consistency and gradual transformation of texture” than they might like to admit.100 Their para-creative parallels to the establishment abound, according to Brackett—“In some respects, BOAC’s relationship to official institutions could not be more a part of institutionalized art […] During performances, the relationship between performers and audience is identical to that of any other classical music

97 Music for Airports liner notes  
98 Goldstein, “New Music for Airports”  
100 Ibid., 213.
event.” A close perusal of programs and liner notes “reveals a similarity between the way in which BOAC and other ‘classical music’ institutions are funded.”

Their outsider credentials may be long expired, but Bang on a Can has been very successful in reshaping elements of the classical music institution from their new perch within it. In recontextualizing Eno’s work and intertwining their legacies, they may be doing something for him that he has already been doing for himself elsewhere. Eno has produced the work of major commercial acts such as Talking Heads, U2, and Coldplay. In 1977, he collaborated closely with David Bowie on *Low*, and his contributions are recognized explicitly on Philip Glass’s 1993 “Low” Symphony, a curious recompositional project that deserves its own analysis. He even worked on a project, “Passengers,” which featured both U2 and legendary tenor Luciano Pavarotti. Eno’s career has crossover written all over it. He serves as a fascinating symbol of the inextricably interdependent legacies of the classical tradition, minimalism, and art pop.

In his post-’89 compendium *Music After the Fall*, Tim Rutherford-Johnson points out that minimalism is particularly susceptible to the kinds of recompositions described above, “a recognition perhaps of this style’s different approach to musical time as a continuous flow rather than as a framed and internally organized singularity.” However, Rutherford-Johnson focuses here on electronic recompositions of originally acoustic pieces, such as the 1999 album *Reich: Remixed* on Nonesuch and Deutsch Grammophon’s six-album *Recomposed* project, in a

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101 Ibid.
broader discussion of the effect of sampling technology and politics on the Goehr’s Werktreue concept in the twenty-first century. He argues that such electronic recompositions challenge Werktreue, introducing “the idea that works of contemporary art music could be reworked and reauthored in the same fashion as electronic music dance tracks.” I agree with this position, which only serves to reinforce the Werktreue-reinforcing tendency of the inverse, electronic-to-acoustic recompositional practice. To treat an electronic, electro-acoustic, or otherwise studio-composed piece as freely appropriable back into a broadly classical music context is to superimpose the latter’s standards and protocol on the former. Thus, even though both practices are manifestations of the postmodern revealing of forms, each serves a distinct narrative within musical and cultural history. Electronic remixes of classical works seem generally to defy Werktreue and the sanctity of the isolated symphonic work, mixing musical metaphors and postmodernistically mocking the idea that forms are fixed and progressing linearly towards an archetypal ideal.

As I’ve demonstrated, Bang on a Can’s Music for Airports does to Eno’s Ambient 1 almost precisely the opposite. The All-Stars’ expressive micro-indulgences shift an inherently nonteleological work back into the realm of recombinant teleology, thus transforming its genre and the political work that it is capable of. Though the project politely acknowledged the functional aspirations of the original recording, it does little to further them. Deliberately subverting Eno’s flat affect and presenting the work in a concert format, even when transposed to the unusual setting of an airport, disregards the principles of ambient music as Eno defined them. I mean this not as a

103 Ibid.
normative criticism of Bang on a Can, especially since, as I have demonstrated, to further the aims of ambient music was never their goal to begin with. Rather, the project reflects the New York post-minimalists’ respect for Eno’s accomplishments and their desire both to reify him and to insert themselves into his legacy. This recompositional project, like many others, provides a vantage point from which to view a fascinating historical process at work. Eno’s album, which fulfills Bürger’s parameters for an institutionally critical work of the avant-garde, has been subsumed back into and changed the very system with which it once wanted nothing to do. The subversive, anti-teleological nature of Eno’s original album was revealed and emphasized by the expressive, ultra-human alternative presented by Bang on a Can’s chamber rendition.
Chapter Three

Listening closely to Nancarrow’s fireworks

Few would argue against Conlon Nancarrow’s inclusion among the most influential members of the twentieth century American avant-garde, a movement regarded as an antitraditionalist institution in its own right. A total hermit for the first decades of his expatriation, Nancarrow’s sizable inheritance afforded him the privilege of a comfortable isolation space and two custom Ampico mechanical pianos to develop his intricate drafting and punching techniques. He didn’t seem to care much for the growing amount of attention he attracted from the new music scene upon his discovery by the likes of John Cage, Merce Cunningham, and Harry Partch. It wasn’t until the late 1960s that Nancarrow developed “a desire to bring thirteen years worth of intensively-composed music out of a vacuum and into the public ear.”\textsuperscript{104} Columbia Records released an academically well-received album of the player piano studies in 1969. As Nancarrow’s fame grew through the 1970s, many fought successfully on his behalf to obtain him a visa to visit the country from which he had self-expatriated forty years prior. Seeking support due to the insufficiency of his dwindling trust fund to support a family, by then three-strong,\textsuperscript{105} the MacArthur Foundation awarded him its lucrative Genius Grant in 1982.\textsuperscript{106} By his death in 1997, he had become a full-on icon of American new music, having attracted the highest endorsements from such luminaries as John Cage, György Ligeti and Pierre Boulez.

Nancarrow accomplished all of this in about as solitary a setting as one can

\textsuperscript{104} Kyle Gann, \textit{The Music of Conlon Nancarrow} (Cambridge University Press, 2006), 46.
\textsuperscript{105} Ibid.
\textsuperscript{106} Ibid., 47.
achieve. Even Mahler, a notorious artistic shut-in, could only afford to play hermit during the summers. The rest of the year was spent conducting both his and others’ work, both because it was conceived for human performers and because music directing paid the bills. Not only did Nancarrow exile himself in Mexico City, but he also made the choice, still radical in the ‘40s, to abandon human performers in order to write exclusively for the player piano. This mechanical contraption, a newer invention than the tape and a completely fresh addition to the contemporary music arsenal, allowed the composer to push the piano’s 88-note range to totally posthuman places—or so he likely thought.

The availability of both the composer’s own study scores, plus the digitization of his piano rolls, eventually led to the effort by a number of groups to reimagine Nancarrow’s Studies for player piano for human performers. Drawing on Pierre Schaeffer’s modes of acousmatic listening, I argue that the reductions in tempo often necessitated by these human recompositions facilitate a completely different and not undesirable way of hearing these pieces than Nancarrow ever intended. Additionally, these live performances necessitate a close examination of the way in which we conceptualize score fealty to an impossible degree of accuracy, the permanency of Werktreue throughout proportionally sound temporal adjustments, and the human relationship to mechanical timing. Like Bang on a Can’s treatment of Music for Airports, these recompositions demonstrate how musical form speaks social meaning.

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By the time he began to search for player piano accoutrements on a trip to
New York in 1947, Nancarrow’s sheer frustration with human performers had already provided him with more than enough reason to adopt the instrument as his primary muse. Even before his work veered inexorably towards the hyper-complex, the composer had serious trouble developing the interpersonal rapport required to implement efficient rehearsal technique. A 23-year old Nancarrow quickly abandoned a Boston-area Works Progress Administration orchestra post after he “found that I don’t have the personality to be a conductor.” Gann adds that this personality, which the biographer himself found “retiring and non-dictatorial,” often had trouble convincing performers to show up to his own rehearsals—for a Septet written in 1940, just before his self-imposed political exile to Mexico City, Nancarrow could not manage to get all of the players in the same room until performance time. When they did show up, he often couldn’t convince them to play what he had written. A 1942 Trio for clarinet, bassoon, and piano was aborted once “the clarinetist refused to play a piece that would, he said, make the audience think he was playing ‘wrong notes.’”

The recalcitrant clarinetist may merit some sympathy. Nancarrow was exposed to many of the modernist musical strains of the early twentieth century during his time at the Cincinnati Conservatory and, afterwards, studying privately with Roger Sessions—though he rejected Schoenberg’s dodecaphony as “a dead

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108 quoted in Gann, 39.
109 Ibid.
110 Ibid., 42.
111 Ibid.
Nancarrow embraced dissonances of both a rhythmic and harmonic nature. During its first movement, the aforementioned Trio pits a chromatic figure in “an implied 5/8 meter in the bassoon working against 5/8 + 7/8 in the clarinet” and “a 5+5+3 octave pattern in the piano left hand,” all while repeatedly stating and retrograding canon after canon. One can understand how players, unconvinced by Nancarrow’s passivity of leadership, might feel left out to dry in the face of such opaque polyrhythmic conceits, with little rehearsal, in front of an audience in the 1940s.

The bulk of Nancarrow’s early compositions seem to be promoting the additive side of the Stravinsky vs. Schoenberg fray that had schematized modernist conceptions of rhythm since the turn of the century. This inclination was owed, no doubt, to the composer’s early exposure to Stravinsky’s *The Rite of Spring*. However, the divisive, hierarchical rhythmic schemes that begin to crop up early on in the player piano studies were prompted by a much younger and quintessentially American composer-theorist: Henry Cowell. In 1939, Nancarrow devoured one of the few extant copies of Cowell’s overtone series-obsessed *New Musical Resources*, which that devoted experimentalist had penned 20 years earlier at the ripe age of 22. Cowell’s chapter on rhythmic harmony was so influential in the course of Nancarrow’s creative maturation that it serves as the opening salvo of Gann’s

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113 Ibid., 58.
114 Ibid., 7.
115 After much haranguing, Knopf printed just 500 copies in 1930, without enough demand for any subsequent release for several decades.
116 Ibid., 1.
definitive biography. Cowell is enamored here with what he sees as a concrete analogy between the principles of meter and harmony. The concept is illustrated most clearly in the description of two pulses, one double the speed of the other.

“If now the taps were to be increased greatly in rapidity without changing the relative speed, it will be seen that when the taps for the first melody reach sixteen to the second, those for the second melody will be thirty-two to the second. In other words, the vibrations from the taps of one melody will give the musical tone C, while those of the other will give the tone C one octave higher. Time has been translated, as it were, into musical tone.”118

Cowell knows that there is “nothing radical in what is thus far suggested.”119 He is far from the first to elaborate this relationship, having picked up its rudiments from his teacher, Charles Seeger. Nor does the concept begin with that esteemed musicologist; even as early as 1739, Leonhard Euler applied his proportional theory of consonance to duration.120 Consistent, however, with Cowell’s adventurous spirit and his overarching goal for the book to explain how, via application of the proportions contained in the overtone series, “a large palette of musical materials can be assembled,”121 he outlines a completely novel way to make literal this correlation between pitch and duration.

His rhythmic harmony involves stacking cross-rhythms in proportions that correspond to pitch intervals. Just as a 1:2 octave translates to double time, a pure fifth in the ratio of 2:3 is expressed rhythmically with a 3:2 polyrhythm. A major third could be translated to 5:4. Thus, “if we were to combine melodies in two beats, three beats, and five beats to the measure, we should then have three parallel time-systems

118 Cowell, New Musical Resources, 50.
119 Ibid., 51.
121 Cowell/Nicholls, Intro to New Musical Resources, xvi-xvii.
corresponding to the vibration speeds of a simple consonant harmony." Cowell was amused by the idea that, if one were to speed up such a 2:3:5 polyrhythm to several cycles per second, it would theoretically morph into a justly-tuned major triad. He was known to keep a pair of linked sirens around which he could detune to their extreme low end for a rudimentary, yet effective, proof of concept: before an audience’s ears, intervals did indeed melt into grooves, and vice versa.

Charm and apparent simplicity aside, the idea is much easier to imagine and notate than it is to execute in a concert setting. Cowell’s *Quartet Romantic*, written contemporaneously with *New Musical Resources*, is meant as a direct application of the rhythmic harmony concept. Yet it was not played until 1978, when players used a click track in the studio to synchronize their convergence points. Cowell’s suggestion that, simply by counting one beat to a measure, a conductor could lead even a simple 2:3:5 rhythmic-triadic harmony “for the measure, no matter what time divisions it included, would begin and end at the same instant,” belies his earnest naïveté about musicians’ capabilities. Further youthful vigor abounds in the finding that, though “the average performer finds cross-rhythms hard to play accurately [...] By experiment we have observed that such rhythms as 5:6:8 or 5:6:9, and other combinations of three rhythms together, can be quite accurately performed by the devotion of about fifteen minutes a day for about six months.”

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122 Cowell, *New Musical Resources*, 51.
124 Ibid., 6.
125 Cowell, *New Music Resources*, 52.
126 Ibid., 64.
“recording the time-values of a passage, as actually played by a capable musician […] found that the lengths of notes as played were quite irregular; for example, the first of the two eighth-notes was almost twice as short as the second,” and so on. Cowell uses this data to buttress his lament for the imprecision of traditional rhythmic notation, but he does not seem to consider whether the capable bassoonist would, in fact, be capable of playing the given rhythm “quite accurately” as notated. This evaluative inconsistency highlights the semantic flexibility inherent to the concept of “accuracy” across different performance media and musical applications.

Further research contends that no bassoonist can play precisely in time. This is not a jab at bassoonists in particular, who tend to be lovely people and first-rate musicians. Rather, human rhythmic cognition tends to be somewhat of an imprecise tool in comparison to mechanical means. Jonathan D. Kramer’s own review of the scientific literature concludes, with ample certainty, that a true “2:1 ratio is virtually never heard, except when electronically produced.” This finding can likely be extrapolated both to the rhythmic and harmonic versions of the 2:1 interval—two bassoonists are more or less equally unlikely to play a true perfect fifth as they are to play precise quarter notes over half notes. In both cases, the bassoonists will only obtain the perfect ratio in the infinitesimal instant of convergence between their two correctional trajectories of timing or intonation in contrary motion—much like Nancarrow’s tempo ratios.

So what if performers play inconsistently—isn’t that what makes us human?

In the case of the rhythmic harmony concept and the *Quartet Romantic*, even the

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127 Cowell, *New Musical Resources*, 55.
tiniest deviation from the defined proportions causes a sort of conceptual breach. In theory, if a single measure from the Quartet were to be recorded and each part stripped of its pitch content, leaving only the rhythm of each instrument’s attack and the relationships between them, speeding up that sample would produce the harmonic equivalent of the prescribed rhythmic ratio. Minute fluctuations in time would render this hypothetical chord out of tune, possibly producing a kind of kaleidoscopic, constantly shifting intonation derived from the internal proportions of the temporal offense. Conversely, a harmonic interval played in imperfect—i.e. human wind and string players’—intonation would produce an unsteady rhythmic relationship when slowed to a crawl. Though I doubt Cowell’s intrepid ear would shy away from such variable sonorities, they are far from congruent with the clearly audible intervals he hoped to communicate via his intricate cross-rhythms.

The literal nature of the relationship Cowell hoped to establish in his early writing is demonstrated to be fully unattainable by unaided human performers in both its rhythmic manifestation and its converse, the harmonic reduction. Throughout musical traditions spanning the globe, composers and players account for and even anticipate these kinds of performative ticks, recognizing to some degree, as Christopher Small codifies,\textsuperscript{129} that a musical work exists fundamentally, even by the standards of the most idealistic composer, within the activity of its wonderfully imperfect reproduction. It is far more than a clinical and inherently noiseless series of notes and stems adorning even the most artful of manuscripts.

\textsuperscript{129} Christopher Small, \textit{Musicking: The meanings of performing and listening}. (Middletown: Wesleyan University Press, 2011).
As Cowell found out with the *Quartet Romantic*, this theoretically-informed exercise was impossible even to attempt within a period performance setting. Without as-yet inconceivable advancements in recording technology or contemporary performance practice, he never got to hear this piece performed within his lifetime. However, though it does not appear that he implemented it himself, Cowell did have a thought about an achievable manner of realizing the piece. Confronting the issue of such close-knit and unperformable polyrhythms that even six months of intense study could not crack them, Cowell suggests that “these highly engrossing rhythmical complexes could easily be cut on a player-piano roll.”\(^{130}\) Given that each note could be measured and punched with painstaking precision and without regard for a performer’s dexterity, the player piano was the perfect receptacle for this kind of work. In the late 1910s, the instrument was in its infancy, mostly considered an upper-crust Muzak dispenser for department stores and dinner clubs.\(^{131}\) Responding to this too-commercial impulse, Cowell notes that “This would give a real reason for writing music specially for player-piano, such as music written for it at present does not seem to have, because almost any of it could be played instead by two good pianists at the keyboard.”\(^{132}\)

Nancarrow rose to this challenge with aplomb. Very few of his studies can even be attempted by just two good pianists at the keyboard, though several duos have certainly succeeded.\(^{133}\) When, prompted by Cowell’s comment, the player piano

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\(^{130}\) Cowell, *New Musical Resources*, 55.
\(^{132}\) Cowell, *New Musical Resources*, 65.
\(^{133}\) e.g. 2004 concert by Jonathan Fisher and Brenna Berman, and recordings by Thomas Adès and Gloria Cheng, and the Bugallo-Williams Duo.
became Nancarrow’s full-time occupation starting in 1948, the instrument freed the composer from the bounds of corporeal and cognitive imperfection, as well as the interpersonal dilly-dallying which had plagued his short musical career in the USA. A divorce from human performers reduced his compositional confines only to his imagination, his patience, the subdivisions of his ruler, and the endurance of his punching arm. Posterity demonstrates that he possessed all four of these qualities in spades—Nancarrow’s ever-complexifying and granularly precise oeuvre pays testament to the former three, and the legend of his unevenly muscled forearms takes care of the last.

According to Jonathan Kramer, “music meant to be performed sounds stiff when mechanically sequenced by a computer, because the ear perceives absolute regularity as awkward and artificial.” Thus, inversely, performers vary supposedly rigidly defined rhythms and pitches, more unconsciously than otherwise, in the natural course of interpreting a score. Moreover, this finding points to the human qualities inherent to listening and music cognition, which are wholly anthropocentric activities. Regardless of the subjective aesthetic judgment, we can reliably distinguish a human performance from a non-human one. However, as established above, certain textures are achievable only by mechanical means or with mechanical assistance.

The entire raison d’etre of the studies was to manifest sonically such extreme and unprecedented textures. Constantly pushing the boundaries of this newly emancipated capacity for polytemporal endeavors, Nancarrow never appeared to be particularly interested in capitalizing on the keen ear for melody on display in the

likes of the jaunty and latently popular\textsuperscript{135} Study no. 6. Though few are accessible to an unprepared listener, the multifarious and easily distinguishable compositional strategies developed over the course of the studies have made it easy for Nancarrow scholars, Kyle Gann chief among them, to construct a taxonomy of these works. Gann corrals the fifty-odd mechanical studies almost contiguously into chapters on ostinato studies, isorhythms, simpler canons, acceleration studies, sound-mass canons, etc. Most every study forges ahead into denser and more esoteric territory than any of its predecessors. Though they begin bluesy and digestible, these early entries in generally identifiable key areas and tempo proportions like 3:5 and 5:7 quickly give way to much more daunting ideas involving shifting tempi and irrational numbers. Moreover, the longitudinal trend over the course of the catalog favors more activity and faster too; exceptions thereto, such as the 12-second, 1,028 note blitzkrieg\textsuperscript{136} at the end of Study no. 25 followed by the plodding 1:1 canon in no. 26, serve as a reminder of the residual humanity behind the tireless tape and the machine it reproduces.

The omni-quantized consistency with which the unerring player piano reproduced Nancarrow’s rhythmic ideas became, in some ways, the utmost sonic hallmark of his opus. This has to do not only with the conceptual means which powered Cowell’s polyrhythmic output, but equally with the fragility of working with extremely close-knit tempo ratios such as 14:15:16, wherein “any interpretive

\textsuperscript{135} See Nancarrow’s Spotify page; as of the writing of this draft, his most played track, by several orders of magnitude, is the Ensemble Modern’s enormously palatable yet dubiously accurate arrangement thereof. This oddity is due entirely to the track’s placement, by one of Spotify’s curators, onto a popular easy listening classical playlist.

\textsuperscript{136} Gann, \textit{The Music of Conlon Nancarrow}, 248.
deviation from strictness is out of the question. The slightest tenuto or rubato in one voice has to be also reflected in the others if the integrity of their relationships is to be maintained.\textsuperscript{137} Since many of the studies deal in imitative canons as their primary coin, such deviations are, compositionally, easy to avoid.

Study no. 37 is, perhaps, the ultimate example of closely proportioned canons. Its official subtitle gives the game entirely away: “Canon 150 / 160\textsuperscript{5/7} / 168\textsuperscript{3/4} / 180 / 187\textsuperscript{1/2} / 200 / 210 / 225 / 240 / 250 / 262\textsuperscript{1/2} / 281\textsuperscript{1/4}” is a series of twelve often overlapping imitative canons in twelve unevenly timed voices—three times as many voices as the next most polyphonic study, and the longest single movement roll in Nancarrow’s collection.\textsuperscript{138} The tempi are derived from the just-tuned chromatic scale in a Cowellian manifestation of the relationship between tempo and pitch. Gann proves that these proportions are lifted straight from Cowell’s book because of the appearance of the idiosyncratic 15:14 ratio for C#, as 160\textsuperscript{5/7} bpm.\textsuperscript{139} However, though Cowell’s figures have everything to do with the conceptual genesis of this study, Nancarrow does not mean to attempt such a direct application of the rhythmic harmony device as does Cowell’s Quartets Romantic and Euphometric. The latter are marked by convergence points between voices at most every bar, providing an audible fingerhold for listeners to understand the nature of the rhythms contained within the conductor’s impracticable single beat per measure. Twelve ratios at the relative proportions of the chromatic scale form about as divergent of a relationship as one can find in any group of sounds. In fact, if a conductor were to beat once per

\textsuperscript{137} Gann, The Music of Conlon Nancarrow, 9.  
\textsuperscript{138} Ibid., 193.  
\textsuperscript{139} Ibid., 194.
measure for the ratios expressed in Study no. 37, the measure would have to be at least \((2.504824915894645 \times 10^{24})\) minutes\(^{140}\) long—equivalent to almost five quadrillion millennia, or about 350 million times the current age of the universe—until all the voices would converge once more. This is essentially the rhythmic-harmony equivalent of moving from common practice triadic harmony, as in the *Quartet Romantic*, to full-on atonality. Whereas Cowell’s converging figures are transparently apprehensible, Nancarrow rarely manufactures a detectable relationship here.

Though many of the prior studies focused extensively on highlighting convergence points, Study no. 37 is limited by the nonconvergent property of its composite polyrhythms. Nancarrow, in an extension of his own highly developed canon-writing technique, includes only five convergence points throughout this study. Of these, only one is even audible; the rest are hidden ingeniously within blocks of rests or sustained notes.\(^{141}\) Though the phasing effects between voices—which all play the same pitch class content at different, often extreme transposition levels proportional to their creation as a result of these few invisible convergence points—are enchanting, their scarcity and opacity preclude any consistency of temporal coordination between all voices at once, which nixes the base assumption of Cowell’s rhythmic harmony. Thus, the task of constructing occasional convergence points requires Nancarrow to pick a focal point at which the voices do converge, and start each voice at precisely the correct distance before it such that each ending aligns.

\(^{140}\) This is the least common denominator of the twelve tempo ratios, obtained with a scrap of Python code that may or may not have actually produced a verifiably accurate result.

This is the case for Canons 2 and 12, which, I suspect, Nancarrow must have punched backwards. Thus, this later work of Nancarrow’s bears only a theoretical resemblance to Cowell’s earlier ideas, having been modified and developed extensively over the 36 previous studies. Yet, Cowell was still on Nancarrow’s mind; the use of his proprietary chromatic ratios proves that much.

Instead of convergence points between voices as its predominant feature, the perceptual emphasis for much of the piece is on the relationships between smaller groups of voices as they overlap and intertwine as a result of their juxtaposition at various tempo-pitch levels as well as their corresponding registral transposition levels, all within extensive stretto passages. Generally, it’s possible, if aurally demanding—a demand correlated directly with playback speed—to follow the logic of the inter-voice relationships. Though pitch transposition levels vary widely between canons, or sometimes even between voices within one canon, Nancarrow usually proceeds through temporal transpositions by half-step: the smallest interval of division between the tempo proportions of which this new chromatic scale is composed. A few of the canons skip a temporal minor third instead, warping the familiarity of the linearly increasing or decreasing tempo progression to create fascinating, heterogeneous textures. However, canons which are aligned so as to overlap half or more of the available voices at once at speeds ranging from 150 to 281¾ bpm produce extremely dense textures, stretching one’s ability to distinguish voices by register or tempo to a similar extreme.

It would be unfair to imply that Nancarrow intended otherwise; by all accounts, he loved the “fireworks” produced by such thick, inscrutable counterpoint.
Moreover, these textures were designed to elicit a specific affective response, as evidenced by his statement that “my essential concern, whether you can analyze it or not, is emotional; there’s an impact that I try to achieve by these means.” However, human perceptual limitations prevent us from hearing these sorts of passages as anything more than a block of sound at the suggested tempo. We can assume that the same imitative, additive process heard clearly at the sparser beginning of the canon continues to take place, but without—and even with—that context, we are lost among the explosive textures which Nancarrow took such wry pleasure wringing from his instrument.

Perhaps the mystery and allure of this hyper-complex music owe their foregrounding more to a question of idiosyncratic taste, rather than being qualities intrinsic thereto. Though I hesitate to speculate about Nancarrow’s creative motivations, his casual use of pyrotechnic vocabulary suggests that he considered reproductions of his piano rolls akin to a fireworks display, inspiring shock and awe among devotees and new music novitiates alike. The latter, having little conception of the rigorous processes at work beneath the sonic chaos assailing them, would likely perceive these concerts as gimmicky demonstrations of the extreme limits of player piano technology. Nancarrow’s colleagues and admirers, with full knowledge of his compositional conceits, still couldn’t possibly derive much meaning from Study no. 37 at full speed. And full speed is formidable indeed—if reproduced precisely at the marked tempi, the roll fits 7,848 notes in 6.5 minutes, or an average of more than 20 notes per second. At this speed, my informed ear can only just take stock of the

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macro-level changes in texture from canon to canon, let alone identify individual voices or small-scale convergence points between them. When 64th notes at 281.25 bpm are involved, controlled chaos ensues.

For some, the appeal of such dense textures is exhausted quicker than for others. Though many share Nancarrow’s passion for sonic fireworks, an overlapping segment of listeners may be equally interested in pulling apart the work to expose the intricate craftsmanship that lies within. To do so requires both a reduction in tempo and, perhaps, an escape from the dense textures produced by the player piano. In addition to the two-piano arrangements mentioned earlier, many contemporary music ensembles—such as the Bang on a Can All-Stars, Alarm Will Sound, and the Ensemble Modern—have played Nancarrow’s studies, employing a variety of orchestration strategies. The motivation for such a difficult task may stem from a deeply-ingrained human desire to reclaim such posthuman works. A more immediate, superficial impetus is simply that performances of Nancarrow’s studies, given their rarity, tend to generate buzz on name recognition alone. However, human performers make accurate reproduction of the studies a challenge, and have spawned large questions about what accuracy even entails when faced with such daunting material.

It would be difficult to frame the issue more bluntly than Clifton Callender, who opens his exacting analysis of Paul Usher’s arrangement of Study no. 33 for the Arditti Quartet by suggesting it is “somewhat ironic that just over half of the nearly 50 Studies for player piano have been arranged for live human performance without,
in many cases, mechanical assistance or even click tracks for coordination.”\textsuperscript{143} Study no. 33, an etude in irrational relationships, makes heavy use of the ratio $2/\sqrt{2}$.

Circumventing the irrational, Usher identified its close relatives, such as $7:5$ (1.4) and $17:12$ (1.417)—difficult cross-rhythms, certainly, but more performable than closer relatives of root 2 such as $24:17$ or $41:29$.\textsuperscript{144} However, the compromise with simpler ratios is that audible convergence points between voices will be more frequent and more aligned, more so as the numbers get smaller, whereas a true $2/\sqrt{2}$ relationship is fully nonconvergent. In order to compensate for this discrepancy, Usher occasionally adds an extra beat into one of the voices; a simple task, given the host of extant mixed meters necessary to reproduce the piece. His repertoire of alignment strategies is vast and too complicated to understand without hours of study, but it seems to be extremely functional.

Ultimately, Callender suggests by the conclusion of his analytical microscopy of this recompositional endeavor, “We should not be concerned with accuracy for its own sake. Instead, what matters is if the performance of the arrangement is close enough to be perceived as a reasonable facsimile of the original player-piano study.”\textsuperscript{145} In order to make such a subjective judgment, he offers the following criteria: “1) Is each voice perceived as moving in a steady tempo and are these perceived tempos in roughly the right ratio?” and “2) Do the events occur at roughly the right time and, most importantly, is the order of events preserved?”\textsuperscript{146} For an

\textsuperscript{143} Clifton Callender, “Performing the Irrational: Paul Usher’s Arrangement of Nancarrow’s Study no. 33, Canon 2: $\sqrt{2}$,” \textit{Music Theory Online} 20, no. 1 (2014), 1.  
\textsuperscript{144} Ibid., 6.  
\textsuperscript{145} Ibid., 21.  
\textsuperscript{146} Ibid.
analyst so concerned with accuracy at the millisecond level, just two pages prior, these are generous terms. Moreover, Callender makes only one mention and thereafter generously accounts mathematically for the most crucial and obvious discrepancy between the Arditti and player piano recordings: whereas the original score calls for a tempo of 140bpm, Usher’s arrangement drops it to 64bpm for the final canon.\textsuperscript{147} This alteration was certainly necessary in order to allow the players to apprehend and reproduce the increasingly thorny material, but a twofold reduction in speed contains the side effect that any misalignments become twofold more audible. Nonetheless, and almost incredibly, Callender finds that any discrepancies between the Arditti Quartet version and the original recording, mediated by both Nancarrow’s notated score and Usher’s punctilious arrangement, are aurally negligible. The sole exception is a missing note which, Callender speculates, resulted from a misreading of the score. Shockingly, the second most significant deviation is the equivalent of the infinitesimal difference between the duration of a thirty-second and a quintuplet thirty-second.\textsuperscript{148} Evidently, the foremost new music specialists among us are capable of astonishing, even machine-like accuracy—if this feat were not already impressive enough, it should be noted (though Callender doesn’t) that this recording was made without the aid of click tracks.\textsuperscript{149}

To add humans into the mix for a work that was never meant to be played live is, usually, to accept and even welcome the individual ticks of timing, intonation, and expression such as those which affected both the Arditti’s Study no. 33 and, much

\textsuperscript{147} Callender, “Performing the Irrational,” 17.
\textsuperscript{148} Ibid., 24.
\textsuperscript{149} Pesic, Polyphonic Minds: Music of the Hemispheres (Boston: MIT Press, 2017), 204.
more so—literally and figuratively—Bang on a Can’s arrangement of Eno’s *Music for Airports*. The live performance in and of itself, regardless of its sonic consistency, is a vitally human activity. In addition to the sheer “excitement of witnessing performers battle such dense and temporally challenging material,” Dominic Murcott points out another complication posed by the addition of a performing middleman to a Nancarrow study. “When the studies are played on a mechanical piano, there is a sense that the listener is communing directly with the composer. When a player is involved then a new and powerful personality is inserted into the relationship. For new listeners to Nancarrow this might not be anything of note. But for those who already know the player piano recordings it can, at times, as in the case of Trimpin’s installations, feel like the performance medium is the dominant entertainment.”\(^{150}\)

There is a certain irony in criticizing live performance for being a gimmick in the face of the purportedly truer art produced by the player piano, given its provenance as a tool of commercial amusement. Though Murcott accurately maps the human performer’s intervention into the composer-machine-audience transaction, he is too quick to label it a distraction therefrom.

As discussed with the case of *Music for Airports*, human performers naturally lend emotional depth to phrases originally designed to sound mechanical, uniform, and lifeless. Regardless of any well-meaning intent to flatten affect, each performer will necessarily bring to each passage a distinct interpretation based on their expressive habits, technical abilities, and other individual variables. A clear example is in the case of the imitative canons of Study no. 37, where performers interpreting a

statement at slower tempi will tend to shape and articulate the material with a
different approach than players straining to reproduce it accurately at double time.
Though these individual flourishes may occasionally obscure the counterpoint,
expressive tendencies will be balanced and even countermanded by the iron rule of
the metronome.

Governance by a click track ensures close approximation of interrelated tempo
ratios, ensuring that expressive or inadvertent liberties are corrected at the level of the
beat division, but does not truly confine a performer to the rigid temporality achieved
by a player piano. Arrangements which do not make use of a click track guarantee an
even further departure from the original metric scheme. Especially if executed by a
talented, cohesive ensemble, these deviations may serve as a method of revealing and
emphasizing key elements of inter-voice relationships which, under a more quantized
regime, would appear unremarkable. In this manner, both individual and collaborative
decisions intervene in the uniform rigidity limiting the expressive potential of the
player piano roll.

The possible diversity of approaches to human-centric arrangements of
Nancarrow studies is highlighted once again in the work of the Bang on a Can All-
Stars, who recorded Evan Ziporyn’s take on Study nos. 3 and 11 on their 2011 album
*Big Beautiful Dark and Scary*. During a personal communication with percussionist
David Cossin, I learned that Ziporyn created click tracks for the ensemble after
becoming dissatisfied with their lack of polyrhythmic precision. Thus, the tracks on
the album feel accurate but mechanical and sterile in comparison to several YouTube

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151 Personal conversation with David Cossin, 3/19/18.
videos which depict the sextet playing the tripartite Study no. 3 slightly under tempo, without click tracks. In addition to a vivid, loose collective rhythmic feel which bears little resemblance to that of the record, the players appear to be communicating across the room and enjoying themselves in a way that strict adherence to a click track often precludes. Though these non-metronomic recordings are far less accurate, in the empirical sense, than their album version counterparts, they allow the ensemble to express more viscerally the overdriven boogie-woogie aesthetic that Study no. 3a/c embodies.

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The player piano, in and of itself, represents a perfectly literal musical application of the late-capitalist gimmickry identified as such by Sianne Ngai in her essay “The Theory of the Gimmick.” She identifies the gimmick as stemming from “both an idea and also its thingy materialization in a ‘gadget,’ ‘article,’ or ‘contrivance,’” where “it is more precisely the transformation of idea into thing in a way that charms but also disturbs us.” The history of the player piano reveals its nature as a doubly-layered gimmick. It once served as an extension of the deeply materialistic aim of recorded Muzak to blanket every public space in America with the blandest possible sonic palette. In excising the need for a human operator, the player piano reinforced this goal. An acoustic piano fills sonic space more efficiently and enjoyably than a tinny recording, and draws more attention. This is the attitude to which Cowell responded at the end of the rhythm chapter of New Musical Resources,

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where in a subtle aside he bemoans the present uselessness of the instrument. In responding to this gimmick, Cowell and Nancarrow positioned the instrument not merely as a replacement for one or two human players, but as a fully superhuman entity with virtually limitless technical prowess. Yet, this evolution revealed a new property of the player piano—perhaps a gimmick, perhaps not—quite unrelated to Muzak’s pacifying airs. Ngai describes the arresting climactic phenomenon of the gag film, “the explosion, an event that can happen only once,” which “epitomizes the gimmick’s status as a device for producing a quick but immediately vanishing aesthetic payoff, one that cannot begin a project or sustain a tradition.”

One thinks immediately of Nancarrow’s love of the maximalist “fireworks” on display equally in such blistering passages as can be found at the end of Study no. 25 or Canon 7 of Study no. 37—which are composed of transparent, self-justifying processes—as in the sheer speed at which he opted to play back many his rolls, especially in his later years.

These kinds of unrelenting, Futuristic textures were certainly regarded as gimmicks of the avant-garde back in the day—in particular, the succès de scandale of the 1927 premiere of Ballet Mécanique at Carnegie Hall, George Antheil’s work for pianolas and Parade-inspired orchestra comes to mind. Nevertheless, composers such as Iannis Xenakis and György Ligeti championed large-scale maximalism, and their works began to gain serious acclaim around the same time as Nancarrow’s most productive period. However, there is reason to suspect that Nancarrow had para-aesthetic motivations for turbocharging his music. In a personal conversation, Kyle

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Gann disclosed to me his speculation that Conlon, the demure Arkansanian, may have felt self-conscious about taking up too much space with his hyper-complex compositions. Yet, this self-effacing attitude devalues the months, verging on years, of exacting concentration required to create any one of the relatively miniature studies—a life-encompassing sum of effort the magnitude of which only the composer himself truly understood. There is enough detailed craft in Nancarrow’s music to merit the kind of thorough listening and analysis usually granted to works of a nominally longer duration. I feel that these works deserve to be more than explosive gimmicks unto themselves, drawing dismissive parallels to the gratuitously maximal noisecore genre.

A more apt comparison than noisecore and a direct line of influence can be traced between Nancarrow’s studies and the Black MIDI phenomenon. Cross-analysis thereof illustrates a clear differentiation between various applications of and motivations for musical complexity. Black MIDI was kicked off on Japanese YouTube-equivalent Niconico by an unusual rendition of the popular anime theme “U.N. Owen Was Her” uploaded in 2009 by user Shirasagi Yukki. This arrangement of the catchy song, programmed in MIDI and reproduced in the piano-learning software/game Synthesia, uses hundreds of thousands of notes and employs ear-popping strategies such as melodies in five octaves; ostinato basslines repeated at 64th or 128th notes to create a buzzing, sustained effect; full-keyboard glissandi at breakneck speed; low-register percussive effects; quasi-spectral gestures in the

\[\text{Via } \text{http://www.nicovideo.jp/watch/sm6896044}\]
extreme registers; and even literal applications of the rhythmic harmony principle, playing a series of notes in harmonic proportions at such a high speed that they generate a perceptible pitch interval. The latter effect is particularly effective as an accompanying textural device. To hear such an unfamiliar, aggressive timbre play in an identifiable key is, to my ears, hauntingly beautiful.

This and other Black MIDI videos, which always employ easily recognizable tunes such as Edvarg Grieg’s “In the Hall of the Mountain King”\textsuperscript{156} fetishize their own complexity, frequently including the word “impossible” in their clickbait titles—a reference to both their human unplayability and the strain that their millions of notes place even on modern consumer-grade computing resources. “Blackers,” as they are known, must possess a keen ear, a lot of patience, and access to a computer rig with superlative processing power. To “black” a tune is to construct a predictable, teleological arc using the aforementioned techniques of orchestration, often contrasting unvarnished statements of the melody and simple chordal accompaniment with their eponymously ultra-dense textures.

Regardless of the direct line of inheritance between Black MIDI and Nancarrow’s studies, to reproduce a Black MIDI song at proportionally slower speeds would not serve the same kind of revealing purpose as I argue it would for Nancarrow’s work. The commercial appeal of the newer music, generated in part by its extreme popularity on and total confinement to YouTube, requires it to adhere to a fairly specific set of aesthetic conventions that prioritize above all the audibility of the

\textsuperscript{156} “Grieg - In the Hall of the Mountain King | Impossible Piano Remix | Black MIDI ~ Sir Spork,” YouTube user MusiMasta - Black MIDI & Impossible Piano Remix, November, 2017. Via https://www.youtube.com/watch?v=p_c6uQHllhZ0
melody. According to the fan-run Wiki portal devoted to the genre, its name refers to the result of transferring a Black MIDI file to digital notation software, producing a score illegibly black with virtual ink. Even without looking at a traditional score, it’s clear from the videos—which always augment their audio with a colorful, real-time piano roll representation—that the priority is density play, paired with visual stimuli in the form of fun-sounding shapes and gestures. My judgment is that “blackers” have seized on, replicated, and developed the gimmicky, marketable gadgets found in Nancarrow, while abandoning the thorny and demanding mathematical foundation that spurred his work to begin with. No more than a handful of the videos I have watched attempt to alter the melody in any way or even reharmonize it, let alone write anything imitative or polyrhythmic; the composers’ goal, in line with the demonstrated interest of their audience, is to dazzle, not to challenge.

Arguably, most of Nancarrow’s works are just as much mathematical as musical exercises. Thinking about the piece clinically, as a series of juxtaposed, cross-referential pitch and tempo ratios at curated durational intervals, makes it easier to put aside issues of aesthetics (and of personal insecurities) in order to suggest that a rendition of Study no. 37 may be conceptualized irrespective of the global tempo of reproduction. In other words, as long as the ratios remain intact, one could play the piece at fully half speed—141.625bpm, or half that, or at any other proportionally consistent “fundamental” speed as long as your metronome has enough decimal points to divide 160 5/7 bpm accurately—without reasonably being accused of mangling Nancarrow’s vision. As the evidence demonstrates, the composer himself did not follow his own prescribed roll speed very religiously. If he felt comfortable
playing his work faster for shock value, I doubt he would object to playing it slower for purposes of clarity. Whereas Black MIDI uses speed as a tool of self-aggrandizement, optimizing itself to remain widely accessible at high velocity, Nancarrow uses speed as an apology. Compensating for the challenging rhythmic intricacies of his work, he played rolls faster in order to draw attention from their more delicate innovations, inflating their gimmicky entertainment value. However, it is worth noting that most versions of Study no. 37, along with others of Nancarrow’s rolls, are only infrequently reproduced at full speed except at the will of the composer himself. In particular, arrangements designed for human performance tend to slow the tempo down simply to take pressure off of the players. But what effect does this have on the audience’s experience of the work?

This inquiry points to Pierre Schaeffer’s concept of acousmatic music, a term he coined out of scholarly necessity in order to analyze his own experiments with musique concrète. Schaeffer, dealing with sampled sounds processed or altered in some way to render them irreconcilably distinct from their parents, wrote that “The sound object is never clearly revealed except in the acousmatic experience,” of listening to an unseen sound source. As Kane discusses, these concepts are grounded firmly in Husserlian phenomenology, which champions the innocent, solipsistic natural attitude via the epoché, “an act of refraining from judgment about the exterior world in order to experience it anew.” Applied to musical engagement, Schaeffer promotes the phenomenological approach in his “reduced” entendre mode of

158 Ibid., 23.
listening, where “we attend to sounds as such, not to their associated significations or indices.”¹⁵⁹ This strategy is a helpful foothold in the occasionally alienating experience of listening to musique concrète, encouraging the listener to consider a sample only in its immediate context rather than engaging in a fruitless guessing game about its acoustic ancestry. Entendre has a more primitive sibling, ouïr, “the most basic mode in which the auditory manifestation of the world is apprehended”¹⁶⁰ while without any conscious assimilation of sonic information at all.

The more active, assumptive modes of listening take a semiotic approach. Écouter “situates sounds in the surrounding sonorous milieu, grasps their distance and spatial location, and identifies their source and cause.”¹⁶¹ Thus, écouter connects sounds to their worldly indices; though the source may remain unseen, it does not go unacknowledged. Comprendre is a further abstraction of this para-sonic association, whereby the reception of sounds “is mediated by sign systems or languages—a type of listening aimed at getting the message from an utterance or proposition.”¹⁶² Comprendre is used in understanding speech, but is equally applicable to higher-order musical concepts.

These listening strategies, though formulated in response to electronic music, can also be used to describe one’s internal monologue—or lack thereof—during an audition of any musical or nonmusical sounds. All music is constructed of various kinds of building blocks which can be located on a spectrum from literal, physical phenomena—frequency, amplitude, timbre—to abstract concepts—form, allusion,
genre—which can be more or less audible based on both one’s education and sonic awareness. For example, though I am familiar with the outline and common variations of sonata form, to identify its components in real-time requires my concentration on and subsequent compréhension of that particular formal element. Though more devoted analysts probably know it intrinsically, it is not yet so ingrained in me that I can hear and identify an essential expositional closure like I would a dominant chord, without conscious effort. If I prefer to ouïr a common practice-era work, I can simply let the music wash over me without paying attention even to the differentiation between the primary and secondary themes, or the harmonic motion. However, in a hypothetical recomposition of a hypothetical sonata which draws attention to its formal features—this could be accomplished, for one, by repeating the primary and secondary themes individually, or the entire exposition, more times than called for in the score to re-emphasize the material—even a disengaged and untrained listener would eventually be forced to écouter, to recognize and recall the form. In this case, repetition could be the key to transmitting information as reliably as possible.

I posit that global tempo is the most salient producer of écouter in Nancarrow’s works. To slow the roll down is to allow the maximalist mass to decoagulate and become compréhensible as distinct voices moving at different speeds. Convergence points between two or more voices at a time are perceived not just as variations on a pre-existing sonority, but as a notable and poignant event. Moreover, the use of superimposed visual stimuli, like a piano roll à la Black MIDI, further enhances the listener’s ability to associate initially foreign sounds with
Nancarrow’s codified system of polytemporal counterpoint and harmony.

Tellingly, the YouTube comments on an almost-full speed video of Study no. 37 reproduced as intended on a player piano¹⁶³ differ drastically from a different video at about 65% speed with a piano roll overlay. This colorful graphic further obscures the physical sound reproduction process—already obscured in a player piano by the wooden housing of its innards—but replaces it with an animated depiction of exactly what notes are being played. Large numbers of users commenting on the video closer to how the study would have sounded in Nancarrow’s studio seem to agree that “This is what it sounds like for a piano to give birth to a Black MIDI song” and “And you thought Stravinsky was crazy.” The slower, colorful piano roll video’s top comments are generally less polemical, expressing appreciation for the effort that went into the visualization and for the music, or “musical exploration,” as one user replied to another who didn’t believe the piece merited the former title.

Until 1989, when Trimpin digitized all of the rolls via the nascent medium of MIDI, reproductions of the studies were limited to recordings and live performances on the rolls alone. However, this technological development allowed the notes to leave the roll without the middleman of Nancarrow’s own study scores. This has allowed at least two Nancarrow scholars, in fulfillment of the ubiquitous musicological desire to peek under the hood, to create stereophonic, synthesis-driven arrangements of Study no. 37. Carlos Sandoval, Nancarrow’s longtime assistant in Mexico City, worked on a twelve-speaker surround sound installation, each channel

¹⁶⁴ “Nancarrow, Study #37 for Player Piano (score+roll),” YouTube user smalin, October, 2014. Via https://www.youtube.com/watch?v=g0gNoELvpPo
of which contains a single voice of Study no. 37. In addition to facilitating concentration on the motion of individual voices or groups of voices by altering one’s position within the system, this arrangement also adds a macro spatial dimension to the stretto effect as voices enter from different angles with respect to the audience.

Robert Willey used the same MIDI data to craft an arrangement which is both stereophonic and multitimbral, mapping each voice to a different synthesized instrument in order to further differentiate the voices. During the 1986 Pacific Rim Festival in San Diego, Willey got the opportunity to show Nancarrow this version of the piece and obtain his reaction. He reports that Nancarrow “said that it was the first time that his music had been improved upon over the original.”

Willey himself seems not entirely convinced by the breezy outcome of this interaction, remarking that even though the “more defined synthesizer version made it easier to follow the lines, it seems that it is not always necessary, or perhaps, even desirable […] The listener's emerging and submerging of awareness of his technique of a multi-tempi canon seems to be part of the mystery and allure” of Nancarrow’s oeuvre.

Like Brian Eno’s tears during the performance of Bang on a Can’s Music for Airports, Nancarrow’s response to hearing his work in a novel format indicates that a recompositional endeavor can often reframe even the composer’s own conception of what the original work means. In the case of Willey’s arrangement, it is the assignment of each voice to a new timbre and their spatialization that facilitate a level of écouter perhaps inaccessible in the original player piano version. These are further

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parameters, in addition to global tempo, which allow the listener access to the guts of the piece in a new and exciting way.

It was not until after Nancarrow’s death that the bulk of human-oriented arrangements of his studies began to emerge, and I have not been able to find a record of his attitude towards these endeavors. To be fair, it was he himself who created the notated collateral that permitted the existence of many of these arrangements, though it remains unlikely that this was their intended purpose. Kyle Gann reports that the composer took several years off of writing new studies in the early ‘60s while coping with a bout of listless depression, instead using this time to create study scores for his extant works. These were then distributed in Soundings magazine in the ‘70s before wider publication later on. Without these scores, it would be nearly impossible to create legible arrangements of the studies. To extrapolate precise metric information and distinguish voices from one another based purely on holes punched in a piano roll would be a Herculean task at the least. Aside from their facilitation of arrangements, these scores are the ultimate facilitators of écouter for those with score-reading capabilities. They shed bright light on all of the studies, which become more inscrutable with each installment.

Given the dual premises that 1) Nancarrow created study scores in order to facilitate écouter and 2) alternative—particularly, human-centric—arrangements of Nancarrow’s studies tend to facilitate écouter via the parameters they modify, the syllogistic conclusion is that Nancarrow would approve of human arrangements of his work based solely on the projected outcome for the listener. To be fair, this is an

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oversimplification which cannot fully account for Nancarrow’s aesthetic sensibilities, but it seems buttressed by the composer’s agreeable reaction to such alternative arrangements as Robert Willey’s, as discussed above. As I suggested, perhaps the “mystery and allure” which Willey aligns with what he considers the Platonic Nancarrow Study Experience was not as essential a quality as it seemed. Though Nancarrow considered it critical to the emotional experience he intended to craft, the speed controls on the player piano, as well as the unquenchable craving of human performers to reclaim this music, have ensured that there are alternative ways to listen to it.

A diagram on a Cartesian plane helps to illustrate the variables involved. To listen to a study at full speed on a player piano is to receive the precise affect which Nancarrow carefully curated and transmitted directly to the player piano roll, without the opportunity to take stock of the temporal counterpoint within. To hear humans attempt the piece at full speed typically mirrors and even enhances this effect, given
the players’ individual means of expression and interpretation, but at the perceptible or imperceptible cost of accuracy. Inverting this relationship across the axis of tempo invariably creates more opportunities for close listening at the expense of the overall emotional impact that Nancarrow intended. However, this area is the domain in which human ensembles shine for their ability to treat contrapuntal lines expressively and provide timbral distinctions between them at typically negligible deviations of precision from the player piano at an equivalent tempo. Human performances aided by click tracks at any tempo mediate between these extremes in a negotiation between mechanical timing and human expression.

The tempo of a piece for player piano is inherently a flexible attribute governed by a physical lever located in the operator’s interface. In fact, tempo is the only real discrepancy between reproductions of a piano roll besides distinct instrumental timbres and preparations. Abstractly, this makes it the perfect medium for a piece employing rhythmic harmony techniques in addition to the virtually limitless technical dexterity for which it was initially selected. If, hypothetically, the tempo lever extended infinitely to the right, it would be possible to cause a literal manifestation of the rhythmic harmony principle—in the case of Study no. 37, this would manifest as a dense, wavering, dodecaphonic cluster. Were such an exercise within the reach of the pianola, which is superhuman but not that superhuman, there would be a fuzzy line between the perception of the piece as individual, steadily accelerating rhythmic lines as opposed to the seething polychromatic mass that it would become at rhythmic harmony speeds. This serves as an apt analogy for the

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167 Nancarrow preferred the hammers of his Ampicos to be outfitted with tacks in order to produce clearer attacks.
similarly fuzzy resemblance of the piece at extremely slow or fast speeds to its own original work-concept—at some point on either end of the tempo spectrum, the piece would cease to be recognizable as Study no. 37 even to Nancarrow himself, despite its perfect replication of the notes that piece contains. The unclear distinction between pitch and rhythm is mirrored in the undefined relationship between the piece and the tempo at which it is reproduced.

As established above, extreme tempo alterations of Nancarrow studies occur primarily in order to permit human performance and, as an unexpected byproduct, to facilitate new modes of hearing the pieces. Whereas high speeds of reproduction generate a lively affect and an understanding of macro form, it is not until the works are slowed down, likely as a result of technical necessity for performance, that the intricate temporal relationships between individual voices are revealed to their fullest extent. Considering Henry Cowell’s rhythmic harmony principle as anthropocentric, since it relies—as a metonym for music as a whole—on the idiosyncrasies of our perception and cognition, it is only logical that Nancarrow’s studies should be demonstrated, via post-posthuman performance, to be equally and inescapably human.
Conclusion

We derive information from a piece of music based on how we hear it. How we listen, though, depends on our expectations and intentions, which in turn are determined by any number of heuristics and factors: setting, time of day, alertness, sound source and level, instruments and genre signifiers, our training and acquired context—the list goes on. We can put on music in the background to soothe, distract, or drive us, or we can foreground it to the center of our consciousness and attention. And we have it on all the time—music has become increasingly portable and ubiquitous over the course of the ‘00s and ‘10s, via always-connected mobile devices and revolutionary (for better or worse) streaming platforms, listening to it—in any mode—is decreasingly a significant act, but it is no less a political one.

New technologies allow us to form new habits, so that every activity can be scored in some form. However, music in the background does not in and of itself produce the palliative effect of the toothless Muzak against which both Eno and Nancarrow-via-Cowell rebelled. One can induce écouter—the full-bodied, informed listening experience—without regard for the alternate occupation of the body, or even the mind, at work or at play.

Doubtless, many Music for Airports fans received the Bang on a Can recordings with excitement, and—nitpicky connotations of “ambient”-ness aside—likely brought it into their listening routine occupying the same soothing, wallpaper-y position that Ambient 1 would have already achieved. Others, hearing the piece for the first time performed by Bang on a Can, might begin to regard it as its own piece, a new kind of symphony. Eno could never prevent listeners from dissecting his work, though he discouraged active listening through his liner notes; if Gordon, Wolfe,
Lang, and Ziporyn had never done so, they never could have conceived of their new version of the piece. When someone already sonically-attuned cares deeply about a piece of music, there can manifest an unquenchable desire to pry open its exterior and find out what makes it tick. This itch is particularly insatiable when there is no score, a perfect écouter-facilitator, available. In the case of electronic or studio-composed music, there may be no score at all, so intense investigation and analysis is required to shed light on its inner workings. Ideally, this will allow a hearing of the piece as a collection of compositional materials and a series of logically interrelated processes.

So it was for the Bang on a Can composers, who found out what makes *Music for Airports* tick via painstaking transcription; they then made it work in a completely different way which aligned with the goals and capabilities of their resident ensemble. Each Nancarrow recomposition discussed in Chapter Three accomplished a similar task, achieving a deep understanding of the processes involved in the player piano study and then replicating them at the highest possible level of accuracy with devices approachable by human performers. In both cases, performance ensembles introduced these works to a wider audience than they reached on their own, but they did so on new terms. Where Eno wanted flat affect, Bang on a Can played engrossing chamber music. Where Nancarrow intended painless fireworks, ensembles disassembled his textures and reconstructed them in slow motion, like a quasi-tonal, Feldman-esque Fourth of July. These recompositions reached more listeners than their original, fixed media counterparts, but carried a distinct political message to them.

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168 This is the language I should have used to publicize my recital.
Listeners who encounter the Ensemble Modern’s interpretation of Nancarrow’s Study no. 6 while shuffling through Grammy-winning recording prodigy Jacob Collier’s mammoth “Jacob’s Optimum Musical Feast” Spotify playlist will have no idea that the piece was originally written for player piano, or even—in the case of that particular arrangement—that the work is written in a fascinatingly irregular tempo ratio. In that context, it’s simply a jaunty blues piece with a nice oboe melody. Without further investigation, none of the content that Nancarrow imbued into his original piano roll would ever be transmitted.

My arrangement of Nancarrow’s Study no. 37, presented during the performance component of this thesis project, uses various recompositional and multimedia techniques to induce écouter as reliably as possible in a range of listeners as educated as professional musicologists to those as uninformed as my parents. The human performance aspect has prompted me to produce click tracks sequenced at \( \frac{1}{4} \) of the original tempo of the piece, much like sections of Usher’s Study no. 33. Though this decision was undertaken mostly out of technical necessity, I realized over the course of the analysis for this paper that the reduced tempo will preclude a reduced listening. Instead, audience members should be able to hear the multifaceted tempo ratios more clearly upon first listening, though they will not get a good sense of the macro form of the piece. This effect will hopefully be enhanced via timbral and orchestrational distinctions and spatial distribution of voices. Moreover, inspired by the equally écouter-inducing effect of the colorful piano roll on user smalin’s YouTube video—in some ways, a recomposition in and of itself—I have developed some gestural movements to be performed alongside each part, further illustrating the
inter-voice relationships and occasional convergence points, which will often here be
seen without being heard. After the initial performance at a glacial pace, the piece
will be sped up to full speed, allowing for a completely new vantage point for
listeners. Projected silhouettes of musicians and dancers will take the place of the live
performers, acknowledging the electronic temporal manipulation of the recently
recorded sound in the same way as a tempo lever on a piano roll.

I intend this recital as a direct response to the reconditioning tendencies of
institutional recompositions which I have uncovered in this paper. It both counteracts
and reproduces the fraught politics of the ambitious case studies presented here,
intervening heavily in semantic transference and authorial intent while
acknowledging and justifying the superimposition of my own curatorial,
anthropocentric vision onto Nancarrow’s mechanical work.
Bibliography

Works in print


*Mahler: a musical physiognomy.*

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Web Sources


YouTube user smalin, “Nancarrow, Study #37 for Player Piano (score+roll),” October, 2014. Via https://www.youtube.com/watch?v=g0gNoELvpPo

Scores


Recordings


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Nancarrow, Conlon. *As Fast As Possible.* With WDR Sinfonieorchester Köln, Ensemble Modern, Bugallo-Williams Duo, and Rex Lawson. WERGO 6733 2, 2011, CD.

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Appendix—Recital materials

Program

Unfolding the Object

A thesis recital by Josh Davidoff
presented in partial fulfillment of Departmental Honors in Music

Saturday, April 14th, 2018
7PM World Music Hall

chromatic rhythm (2018) Josh Davidoff
for laptop orchestra* and audience conductors
5 minutes

Study No. 3c for Player Piano (1950) Conlon
for clarinet, electric bass, and tape
6 minutes

Study No. 37 for Player Piano (1968)

i. quarter speed
for amplified flute, clarinet, viola, two guitars, tenor saxophone, electric bass, keyboard, four-channel tape, and six movers
25 minutes

ii. full speed
for twelve-channel tape, seven movers, and silhouettes
6 minutes

(iii) unfolding
for twelve-channel tape, conducted laptop improvisers*, and silhouettes
11 minutes

instrumentalists
Marie M. Novack, flute
Jordan Dykstra, viola
Dave Scallon, guitar
Matthew Foss, guitar
Terry Gross, tenor saxophone
Johnny Glimmon, bass
Eric Dorsa, keyboard

movers
Rose Beth Johnson-Brown
Katherine Paterson
Ryan Dobson
David L. Caruso
Tessa Monson
Emma Lohrer

projections
Zack Lohrer

laptops
Alexander De La Rosa
Julian Johnson
Benjamin Novack
Charlie Dobson
Isaac Price-Steade
Jeremy Freeman

*auxiliary Max/MSP patching by Prof. Paula M. Mathis

set design & production management by Tessa Monson
illustration by Rena Yehuda Newman
poster design by Georgia Beall
Conlon Nancarrow liked writing for player piano because he found people difficult to work with. unencumbered by humanity, the player piano could execute virtually any material without regard for technique, and Nancarrow’s pieces sounded exactly the same every time he rewound the roll. crucially, the artificially animate instrument also wouldn’t matter under its breath when asked to do something challenging. recently, though, some new music specialists started to matter about not having the opportunity to play these wonderful, mechanical Studies. many ensembles have since attempted to play this music live, both with and without the aid of click tracks, and I am proud to count ours among that group tonight.

The thesis of my written thesis is that pieces do different work when played by machines—though high in precision, they can lack the qualifiable je ne sais quoi that is the warmth and depth and relative unpredictability of human expression. our own technical limitations have led us to alter the marked tempi, as one can alter the playback speed of a piano roll. though Nancarrow famously loved the sonic pyrotechnics generated by playing his work at breakneck speed, our (very) relaxed tempo affords a novel way of hearing the piece and the relationships between its constituent voices.

Though his earlier works for the player piano tended to be simple rhythmic experiments with a tinge of Americana, Nancarrow soon developed a denser sound. Study No. 37 is particularly interesting to me because of its extensive canonic imitation—twelve distinct voices play the same twelve passages, each at different pitch levels and speeds. the values of these individual tempi are derived from the natural proportions of the chromatic scale.

Nancarrow got the idea that pitch and rhythm are manifestations of the same physical phenomenon from Henry Cowell, who also suggested the use of the player piano to execute this difficult “rhythmic harmony.” I am fascinated with the effect of speeding up a simple cross-rhythm to produce an audible interval—for example, playing a 3:2 pattern at very high speed will sound a perfect fifth.

Theoretically, if you speed up sections of Study No. 37 to the extreme, it would render all twelve chromatic pitches of an octave at the same time. though such a feat lies beyond even the capabilities of the player piano, it might be doable with laptops. either way, there will certainly be fireworks.
Max/MSP materials for “chromatic rhythm”—user interfaces
(based on Nancarrow 37 tempo ratios)

Client patch

Conducting patch, optimized for audience members via Korg nanoKontrol 2 MIDI interface
Playback patch, adapted from Study No. 8 patch by Prof. Paula Matthusen
Study No. 37 playback and pitch shifting Max/MSP patch—user interface

1. Audio on/off
   - Double click to adjust audio levels
   - *Set Max/Min Volume levels

2. Dry gain to headphones
   - Dry gain to speaker
   - Wet gain (w/ pitch shift)

3. Open click track playback file
   - Open midi playback file
   - Click track level
   - Midi level

4. Turn on to play click and midi
   - Turn off and on to restart

Study No. 37 MIDI and click track sequencing—Logic environment
Sample page of transcribed part for Study No. 37 at quarter time
Tenor sax with pitch shifting instructions and timestamps penciled in
Concert rundown cheat sheet for performers

pre-concert: just hanging out, chatting with people as they arrive if you want

when you’re not performing, sit in the audience or on the window ledges.
don’t go in the wings

laptop players drift to places at **7:05pm**

1. chromatic rhythm with **laptops** – 5 minutes

2. Study No. 3c with Johnnie and Josh – 6 minutes

3. Study No. 37 quarter time with **instrumentalists** and **dancers** – 25 minutes
   a. laptops needed to start mvt. 1 tape: Charlie, Jeremy, Ben, Julian
   b. raise your hand when ready. everybody starts together on Josh’s cue.

4. Study No. 37 full time with **dancers** and **video** – 6.5 minutes
   a. needed to start mvt 2-3 tape: all laptops plus Marie, Johnnie, Dave, and Jordan
   b. Alex starts video with Zack behind screens
   c. raise hand when ready, start on Josh’s cue
   d. dancers exit immediately to window ledges when finished

5. Study No. 37 unfolding with **laptops** and **video** – 11 minutes
   a. by the time dancers exit, laptops should be in places
   b. refer to mvt. iii structure sheet

6. all return to stage and **bow** together, make sure to stand next to the person wearing the same color socks as you (sorry @laptops I didn’t buy enough)

afterwards: it would mean a lot to me if you could help with strike and **load out** 😊 we need to box up the speakers and bring them back to AWKS 112. if everybody takes one the load will be light.

after-afterwards: reception at **113 Cross w/ snacks!**
Text score for Study No. 37, mvt. iii

Study No. 37 mvt iii – “unfolding”

1 = sample from canon 1 folder according to your part number. select and loop just the first note. fade in low and slow and don’t process (1.5 minutes)

2 = stay at your current low volume level but begin to process the tone, make it wobbly and unstable (1.5 minutes)

3 = load sample from canon 7 folder in the other window according to your part number. fade in slow and find a consistent texture, make sure it’s initially recognizable as the descending 4ths but then start to make it sound groovy (1.5 minutes)

4 = process and distort the canon 7 sample even more but keep the volume steady (45 seconds)

5 = improvise freely with the samples currently loaded, get louder but don’t cover the tape (45 seconds)

6 = BUMP THE GAIN and cover the tape completely. get extremely loud immediately on my cue then fade down to nothing following my hand (15 seconds)

7 = load up part 10 samples in both windows. select a click track corresponding to your part (c#) and a canon (cc#) in the other. hit select all and normal on both and fade them up. leave the click track running normal and improvise with the canon a little bit (1 minute)

8 = click track to tone. load the hamming algorithm in the click track window and leave the duration all the way up. when I point to you, slide the duration all the way up in a length of your choosing. when I point to you again, slide it down. while I’m not pointing to you, continue to improvise with the cc sample. I will point more frequently as this section continues, so please pay attention (3 minutes)

9 = with my hand, everybody slides duration down (creating a tone) slowly all at once, and then mutes/turns the DAC off on my cue.