

"Curiouser and curiouser!" cried Alice (she was so much surprised that for the moment she quite forgot how to speak good English); 'now I'm opening out like the largest telescope that ever was! Good-by, feet!' (For when she looked down at her feet, they seemed to be almost out of sight, they were getting so far off.)"

- Lewis Carroll, *Alice in Wonderland*

Fantasy and the Concert Hall¹

Matt Malsky

The Logic of Electronic Sound Reproduction

In 1941, the famously despondent Theodor Adorno worried about the detrimental effects of radio broadcast upon the symphony. He theorized that much of value was lost when listeners experienced an orchestral performance of a composition in symphonic form through its electronic transmission to their kitchens rather than in a concert hall. Based upon empirical research done in collaboration with Paul Lazarsfeld and the Princeton Radio Research Project, he argued that the "presence" of music was lost to the radio listener, and with it a part of music's "auratic" spell, its uniqueness in time and place, its ritual, cultish radiance.² Heard through the technological mediation of radio broadcast, the symphony's physicality, its immersive sonic quality, and the attending ability to replace a quotidian, "serial" perception of time with the "suspension of time-consciousness" were all damaged. Separated from its origins in the concert hall, the experience of the symphony was deprived of its unity as an aesthetic totality. The work was likely to be perceived as a series of reified quotations, snatches of melody taken out

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² Adorno's published contributions to the Radio Research Project all touch upon the relationship between musical experience and technological mediation. The discussion above is drawn principally from "The Radio Symphony: An Experiment in Theory," in *Radio Research 1941*, ed. Paul Lazarsfeld and Frank Stanton (New York: Columbia University Office of Radio Research, 1941), pp. 110-39. Adorno's other relevant contributions to the Project include: "A Social Critique of Radio Music," *Kenyon Review* 7, no. 2 (1945): pp. 208-17 and "On Popular Music," (with the editorial assistance of George Simpson) in *On Record: Rock, Pop and the Written Word*, ed. Simon Frith and Andrew Goodwin (New York: Pantheon, 1990 [1941]), pp. 301-14. All of these studies were part of a larger, still unpublished work, *Currents of Music: Elements of a Radio Theory*. For an extensive discussion of Adorno's writings at this time, see Martin Jay, *The Dialectical Imagination: A History of the Frankfurt School and the Institute of Social Research 1923-1950* (Boston: Little, Brown and Company, 1973), pp. 190-193.

Adorno adopted Walter Benjamin's categories of "aura" and "simultaneous collective experience." See Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," in *Illuminations*, ed. Hannah Arendt (New York: Schocken Books, 1955), pp. 217-52.

of context, while the listener was doomed to a regressive subject position, depoliticized and passive, masochistic and self-abnegating.³

Adorno implied that to avoid a fetishized experience of music an audience assembled as a social entity (engaging in the "simultaneous collective experience" of the concert hall) should sit upright, face forward, and bring to bear all possible concentration and musical training to the task at hand: understanding the meaning of the symphonic work. It is a listener's ability to comprehend the performed music's "immanent logic," its grammar and syntax, that will allow access to the work's representational and structural dimensions. Music's utopian function, its support of individuation and critical thinking, though cast by Adorno as a negative dialectic, is accessible only through the listener's attempts to grapple with the musical work's integral form and organization.⁴ Our mission as listeners, futile and ultimately hopeless though it might be, is to resist the seemingly inescapable logic of the culture industry. Adorno suggests that the listener's attendance in the concert hall is indispensable if music is to operate as a bastion for the autonomous individual.

While mournful of the impending loss of his most favored type of listening experience (not to mention symphonic form itself), Adorno's argument underscored the importance of performance space to listening. Adorno implied that, no less than through its ritual, political, and economic functions, the acoustics of the concert hall were an essential element of the post-World War Two listening experience.⁵ As Adorno recognized, each concert hall imparted a distinctiveness to the sound, the characteristics of which were only partially transmissible through electronic means. Adorno hoped that

³ Adorno most thoroughly explores the effects of modern life upon the subject position of the listener in late Capitalism in "On the Fetish Character in Music and Regression in Listening," in *The Essential Frankfurt School Reader*, ed. Andrew Arato and Eike Gebhardt (New York: Continuum, 1982), pp. 270–318 and "On the Social Situation of Music," *Telos* 35 (Spring 1978): pp. 208–17.

⁴ This method of listening is designated by Adorno as "expert." His taxonomy of musical listeners is found in the opening chapter of *Introduction to the Sociology of Music*, trans. E. B. Ashton (New York: The Seabury Press, 1976 [1962]). It should be noted that, under the prevailing social conditions, Adorno saw the prospect of making experts of all listeners as "an inhumanly utopian enterprise." For a discussion of Adorno's utopian vision of the concert repertoire, particularly the works of Beethoven, see Rose Rosengard Subotnik, "Adorno's Diagnosis of Beethoven's Late Style: Early Symptom of a Fatal Condition," in *Developing Variations: Style and Ideology in Western Music* (Minneapolis: University of Minnesota Press, 1990), pp. 15–41 and "Toward a Deconstruction of Structural Listening: A Critique of Schoenberg, Adorno, and Stravinsky," in *Deconstructive Variations: Music and Reason in Western Society* (Minneapolis: University of Minnesota, 1996), pp. 148–76.

Music, Imagination and Culture (Oxford: Clarendon Press, 1990) by Nicholas Cook offers a far-ranging and insightful summary of the literature since Adorno on musical (and non-musical) listening. *Musicking: The Meanings of Performing and Listening* (Hanover, NH: Wesleyan University Press) by Christopher Small is a reading of the concert hall within the context of musical listening as a "process." See especially the opening chapter.

⁵ Adorno identified the origins of the fortuitous coincidence of site, occasion and musical content with the literature written for the historical mass orchestral concert, the heyday of the symphonic form. For discussion of the rise of the public concert and the opening of concert life to a large, European middle class population see William Weber, *Music and the Middle Class: The Social Structure of Concert Life in London, Paris and Vienna, 1830–48* (New York: Holmes & Meier, 1976). For discussion of the parallel growth of the mass orchestral concert in the U.S., see Nancy Newman, "Good Music for a Free People: The Germania Musical Society and Transatlantic Musical Culture of the Mid-Nineteenth Century" (Ph.D. diss., Brown University, 2002). I am, as always, indebted to Dr. Newman for her generous insights into historical (and contemporary) concert life.

all those features of the space itself that contribute to auratic "presence," including both those socially contingent and bodily experienced, would provide a support for his fully adequate mode of musical conduct, "structural hearing." His arguments pointed to an architectural technology which might be harnessed in the service of an artistic rather than a commodity function. The symphony might be on the radio to sell soap, but Adorno held out the "live" orchestral concert as a site at which we might participate in an unalienated aesthetic experience.

Sixty years have now passed since Adorno suggested the effects of performance space upon listening, but there is little evidence that this type of idealized "live" musical experience is possible today. Instead, the post-World War Two concert hall, like the radio, is part of the modern communications infrastructure, a rationalized channel for the efficient transmission of (mostly) standardized common-practice era symphonic compositions by standardized ensembles to appropriately constituted audiences. Our contemporary concert hall as a public gathering space is anything but a transparent acoustic container. The end of the symphony as a viable aesthetic vehicle, in Adorno's sense, was coincident with the growth of the concert hall as a mechanical technology, one guided by the introduction of the new scientific discipline of acoustics to the practices of architecture. As we will see, the concert hall has, since Adorno wrote his "Radio Symphony" article, evolved into an institution predicated on—some say corrupted by—electronic reproduction.

This paper will examine the notion of live musical performance and its spaces in the context of the contemporary cultural logic of electronic reproduction. This is a logic that binds musical subjects and the semiotic mechanisms through which understandings can arise. Listening through electronic mediation entails a rapport of audiences with the available processes of signification that make musical experiences comprehensible. The next section of this paper will present a short history of acoustical building design as an evolving signifying system. First mechanical and now electronic means intercede between the people making music and those listening. The objective of architectural acoustics is to manage space and delimit the understandings we, as audience members, can derive through our participation. This paper will begin with a history of new methods of imagining where music-making can happen: how does the construction of performing space influence our sense of the reality of a concert experience?

While electronically mediated listening is only beginning to infiltrate our concert halls, it is already pervasive in our simulacra of concert life: cinema and recorded forms of music. This development is the focus of the second section of this paper. Through enculturation, we understand a range of established techniques of audio production and reproduction. By understanding these technical practices we are able to accept certain representations as credible, and follow the course of a signifying chain. However, when the audio practices used to present the concert exceed these norms, a different psychoanalytic register is engaged. If our "normal" experience of concert life is structured by the Lacanian symbolic order, then extraordinary concert depiction—"rendering"—is organized by fantasy. When sound and music are rendered, something previously inexpressible can be revealed, and the concert hall can become a site to engage our desires and fantasy lives.⁶

⁶ Michel Chion also juxtaposes *reproduced* and *rendered* as categories of recorded sound. See Michel Chion, *Audio-Vision: Sound on Screen*, trans. Claudia Gorbman (New York: Columbia University Press,

The final section of the paper will explicate the mechanisms by which electronically mediated concert representations evoke fantasies from their audiences. Drawing examples from recorded popular music (i.e., on compact disc), and contemporary compositions intended for concert presentation (i.e., electroacoustic pieces), I suggest that these diverse media all share the same boundaries. A song by Macy Gray, and compositions by Pierre Boulez and Paul Koonce all participate in "reproduction" of established norms of representation, and go beyond these conventional codes. To exceed reality, the rendered experience of music must meet three criteria: it must be enclosed in a narrative frame; there must be a pathological source associated with the music's production; and the scale of the music must suggest an impossible sonic environment. Our contemporary concert life is necessarily structured by our experiences listening through electronic means. The range of these experiences runs from those that support the existing discursive networks through examples that imagine a new consciousness through an engagement with fantasy.

The reproduction of musical space

In August 1999, the *New York Times* reported that one of the nation's most prominent performance spaces, the New York State Theater in Lincoln Center was about to install what was euphemistically called an "electronic sound-enhancement system."⁷ Changes had long been deemed necessary. Since 1964, when the hall was built, many different approaches had been tried to correct for sonic concessions made in the original design by architect Philip Johnson. The auditorium was intended as a multi-purpose facility built to be shared by the New York City Opera and the New York City Ballet. The Ballet was the more established cultural institution at the time, and its founders, George Balanchine and Lincoln Kirstein, demanded a stage upon which dancers' footsteps would be inaudible to the audience. While an acoustical design that swallows all sounds emanating from the stage is highly desirable for dance, exactly the opposite is necessary for performances of opera; singers on the stage should, of course, be audible to the audience.

The goal of the new sound-enhancement technology, on provisional loan from its developers, Acoustic Control Systems, differed significantly from the increasingly ubiquitous and often blatant sound reinforcement (i.e., amplification) found in "live" musical performances ranging from Broadway musical theater to the Vienna Philharmonic open-air concerts on the Platz.⁸ "The intention is not to raise the sound

1994), pp. 109–114. As will become apparent shortly, my own use of these terms differs from Chion's definitions in many respects; see footnote 43, below.

⁷ See Anthony Tommasini, "Meddling with Opera's Sacred Human Voice," *New York Times*, August 3, 1999, and "Enhancing Sound in a Hush–Hush Way," *New York Times*, August 18, 1999 for reporting on the Lincoln Center sound system installation and public reactions. Also, James Glanz, "Art + Physics = Beautiful Music," *New York Times*, April 18, 2000 for a feature article about similar installations. Loud public critiques of British concert hall installations are found in Sir Richard Fairman, "Discord Runs through Music," *The Financial Times*, June 26, 1999, and Elizabeth Silsbury, "Deafening Silence over 'Enhanced' Sound," *The Financial Times*, July 10, 1999.

⁸ For information on the Dutch company, Acoustic Control Systems, see <http://acs-bv.nl> (last viewed July 10, 2002). Included on this web site are a list of installed systems and working papers on the underlying acoustic concepts with a description of how this research is applied in their products. The outdoor installation at the Vienna Festival is described at <http://www.lares-lexicon.com/other.html> (last viewed July

level," said Lawrence Kirkegaard, the architectural acoustician who supervised the installation. "The effect will be that the singers sound like they are singing in a more intimate space." "We view it as electronic architecture," said Martin Oppenheimer, the board chairman of the City Center of Music and Drama, the parent organization that oversees both performing groups. It will "enhance the acoustics of the space," not amplify the voices, he added.⁹

Preceding this controversial proposition to redesign acoustically the concert hall via electronics was another revolutionary notion barely a hundred years old: the invention of architectural acoustics itself. Until the 1890s, new designs for both instrumental and operatic performance halls—which have parallel but distinct histories—were predicated on successful, older models.¹⁰ New halls were most often larger versions of existing designs.¹¹ In distinction, two American buildings, Adler and Sullivan's Auditorium Theater (Chicago, 1889; 6,200 seats) and McKim, Mead and White's Symphony Hall (Boston, 1900; 2,631 seats) stand at the foundation of a new practice: the deliberate application of scientific principles to the construction of musical performing space. Though architectural concern for clarity of speech can be seen as early as Roman theater design, the designs of Symphony Hall and the Auditorium Theater represent the consolidation of previous research and advances in the study of the physical properties of

10, 2002). Also see the report of July 15, 2002, "High Tech and Outdoor Performance" on *All Things Considered* (RealAudio archive available at <http://www.npr.org>).

⁹ As quoted in Tommasini, "Meddling with Opera's Sacred Human Voice."

¹⁰ The most comprehensive source and broadest perspective of historical information and analysis of buildings for music is Michael Forsyth, *Buildings for Music: The Architect, the Musician, and the Listener from the Seventeenth Century to the Present Day* (Cambridge, MA: The MIT Press, 1985). Also, see Leonid I. Makrinenko, *Acoustics of Auditoriums in Public Buildings*, ed. John S. Bradley, trans. R.S. Ratner (Acoustical Society of America, 1994); Richard Talaske, Ewart A. Wetherill, William J. Cavanaugh, ed., *Halls for Musical Performance: Two Decades of Experience, 1962–1982* (Acoustical Society of America, 1982); Leo L. Beranek, *Concert and Opera Halls: How They Sound* (Acoustical Society of America, 1996); Leo L. Beranek, *Music, Acoustics & Architecture* (New York: John Wiley & Sons, Inc., 1962); Robert Elkins, *The Old Concert Rooms* (London: Edward Arnold, 1955); Nikolaus Pevsner, *A History of Building Types* (London: Thames and Hudson, 1976); Percy Scholes, *The Mirror of Music 1844–1944*, vol. 1 (London: Oxford University Press, 1947); and Simon Tidworth, *Theaters, an Illustrated History* (New York: London and Praeger, 1973).

¹¹ For example, when the city of Leipzig had outgrown its concert hall, the logical point of departure was to take the existing "shoebox" design, its proportions and material construction, as the basis for the new. As a result, the Neues Gewandhaus (1886, 1560 seats) was conceived essentially as an enlarged version of the Altes Gewandhaus (1781, 400 seats). The economics of a successful and burgeoning concert life throughout England and the Continent led to more, larger and often purpose-built facilities for symphonic performing organizations which were increasingly professional and full-time. While a concert hall conducive to the performance of contemporaneous programs was not assured by this method, using a previously acceptable exemplar was less likely to lead to a costly disaster. One might say that an "evolutionary" approach came to dominate hall design in the nineteenth century as the stakes grew.

Beranek makes explicit the Darwinian metaphor: "Good and bad halls exist in every age, and good and bad halls have probably been built in every period. It is more than likely that the old halls that are still standing are among the best that were built. Very few halls that compared badly with their contemporaries are still with us. In fact, poor halls are often destroyed or replaced before they are 50 years old, as Boston's most recent Opera House (1909 to 1958) and New York's Italian Opera House (1833 to 1839) remind us. On the other hand, heroic measures are often taken to preserve good halls; witness the public's response to the news that Carnegie Hall in New York was to be destroyed" (*Music, Acoustics & Architecture*, 11).

sound in enclosed spaces (i.e., room acoustics).¹² Building upon *The Theory of Sound* (1877-78) by Lord Raleigh, the Harvard physicist Wallace Clement Sabine expanded acoustic knowledge of reverberation, the manner in which sound is dispersed throughout and reinforced by the architectural space.¹³ Boston Symphony Hall is, in fact, modeled after the classic proportions of the Neues Gewandhaus, but its expansion in scale was guided by Sabine's revelations about the relationship between room volume and dimensions, the position of reflective surfaces (i.e., balconies), and the absorptive qualities of the building materials. Adler's Auditorium Theater was the first hall to incorporate Russell's theory of the isacoustic curve; it was designed around the realization that direct sound reaches each audience member in a manner analogous to direct lines of vision.¹⁴ There were certainly previous attempts to manipulate the sound of musical performing space, though they were not sustained or successful enough to constitute a new paradigm in design. The worst of these Michael Forsyth calls "quack cures for buildings".¹⁵ However, the work of Adler and Sabine initiated a more thorough application of quantitative theories of sound to building construction, and the institutionalization of the expectation that scientific principles should be the basis of concert hall design. With the successful completion of Symphony Hall and the Auditorium, architectural acoustics had become what Thomas Kuhn has called "normal science."¹⁶

With its grounding in physics, Sabine's research has proven foundational. Due in large part to the influence of his findings, the applied form of architectural acoustics has become a sub-discipline of mechanical engineering. With the designation of measurable quantities and properties of performing spaces, as well as a growing body of knowledge

¹² For acoustic interventions in the design of Roman theater, see Vitruvius *De architectura* (New York: Dover, 1974).

¹³ In *Buildings for Music*, Michael Forsyth reports the story of discipline's mythic origins in this way: "In 1895 Harvard University had just completed the Fogg Art Museum, and the large amphitheatrical lecture hall in the building had turned out, against expectations, to have very poor acoustics for speech. The university authorities approached the Physics Department for advice on what could be done, and the department passed on the assignment to its youngest assistant professor, twenty-eight-year-old Wallace Clement Sabine (1868-1919). Applied acoustics was not Sabine's field, and very little scientific knowledge on the subject existed anyway, but he gave the matter his full attention. The problem was that excessive reverberation was obscuring the sound, and in order to correct this he carried out a series of experiments on sound absorption, so as to discover a mathematical formula by which he could predict the reverberation time of a room from its volume and from the sound absorption of the materials from which it was built. In doing so, he became the founder of modern acoustical engineering; he went on to design the acoustics of Boston's Symphony Hall, still considered one of the best halls for music in the world" (p. 235). See also Wallace Clement Sabine, *Collected Papers on Acoustics* (New York: Dover, 1964).

¹⁴ See Forsyth, *Music for Buildings*, pp. 235-253 for a discussion of both Boston Symphony Hall and the Chicago Auditorium. John Scott Russell's "Treatise of Sightlines," *Edinburgh New Philosophical Journal* 27 (1838) is reproduced in George C. Izenour, *Theater Design* (New York: McGraw-Hill, 1977), pp. 597-599.

¹⁵ *Music for Buildings*, 245. Beranek opens his classic study of concert halls, *Music, Acoustics and Architecture*, by debunking several of these nineteenth-century misconceptions: on the analogy of the violin, concert halls should have a thin wooden lining on its inner wall; broken glass shards under the stage or large external constructions (such as the giant teacup-shaped water cistern in the basement of the Philadelphia Academy of Music) can improve internal hall acoustics; and, like a fine wine, hall acoustics improve with age (pp. 8-12).

¹⁶ See Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2d ed. (Chicago: University of Chicago Press, 1970), especially chapters one through three.

about the physiological, cognitive and perceptual dimensions of hearing, has come the ability to deploy volumes, shapes, dimensions, and reflective or absorptive surfaces with increasing certainty. For example, the successful acoustic consultation by Leo Beranek with the new Tokyo Opera City has recently been heralded as indicative of what is now possible, even though the challenges are still great.¹⁷ Though the process of building a good sounding concert hall begins with the initial architectural design, construction and "tuning" of a new hall, finished halls through the last half century frequently have included mechanical means for adjusting and tailoring the sound of the hall for specific uses (or repairing inadequacies): acoustic shells behind performers, moveable sound absorbing materials such as curtain walls, and reflecting panels are all commonplace. A recent example of a concert hall which allows easy acoustic modification is Bass Hall in Fort Worth, Texas. Elaborate, louvered doors at the rear of the hall activate reverberant chambers.¹⁸ At the extreme end of this approach is the almost infinitely malleable acoustics of the Espace de Projection, the composer's "workshop" at IRCAM in Paris, with its motorized walls and ceilings, and selectable surface materials.¹⁹ As awareness of how space influences sound quality has changed, so has the relationship between composition and performance space. Before the age of the mechanical concert hall, compositions were often commissioned for a particular site and occasion, and conformed to (or took advantage of) the qualities of that space.²⁰ However, the opposite is now true.

¹⁷ Acoustician William H. Cavanaugh has said: "Going to the Moon is much simpler as a physic[s?] problem. In a Moon shot, you've got one source, you've got one trajectory that will get you there, and you've got one 'listener,' or destination." Quoted in Glanz, "Art + Physics = Beautiful Music." Of course, examples of acoustical design failures still abound. For example, Beranek's own acoustical design of Philharmonic Hall (now Avery Fischer Hall) at The Lincoln Center for the Performing Arts was carefully documented and heralded. Yet soon after its opening, the acoustics were considered a disaster (the mitigating factor being that the architect neglected to follow all the acoustical design advice). For a fascinating description of Daniel Pinkham's commissioned orchestral composition and its use during the "tuning" week process for Lincoln Center's Philharmonic Hall, see Beranek, *Music, Acoustics & Architecture*, pp. 526–540.

¹⁸ See the web site of Jaffe, Holden Acoustics (<http://www.jhacoustics.com/projects/projects.htm>) for more information and other examples of their projects, which are categorized as either "architectural" or "electro-acoustic."

¹⁹ "The main experimental space, the Espace de Projection, where there are frequent public performances, is a very large, white room with red-colored steel gantries, which accommodates 400 people and has adjustable, motorized walls and ceiling to vary the acoustics. It is virtually a musical instrument in itself, as its required acoustic settings are written into the scores of works. The Espace is 82 ft. (25 m) by 88 ft. (27m) by 46 ft. (14 m) high. The surfaces are variable on all six sides: the ceiling is in three sections and can be raised and lowered so as to be capable of a 4:1 change in volume; the floor is modular and consists of panels with changeable finishes; the walls are built of 172 triangular panels capable of rotating to expose various finishes—sound-absorbent, reflective, or diffusing." (Forsyth, *Music for Buildings*, p. 316).

²⁰ Although the literature on the relationship between particular concert halls and compositions is relatively meager, several notable examples may be mentioned here: Bach's larger choral works, including the B-minor Mass and the St. Matthew Passion, were written for the Thomaskirche, where relatively short reverberation time resulted in greater vocal clarity. (See Thurston Dart, *The Interpretation of Music* [London: Hutchinson's University Library, 1954]). Jürgen Meyer has argued that certain of Haydn's symphonic works used more *forte tutti* passages than in previous compositions because they were tailored for the Great Hall at Eszterháza Castle. (See Meyer's *Acoustics and the Performance of Music* [Frankfurt/Main: Verlag Das Musikinstrument, 1980]). Also, see "Melody and the Origin of the Musical Scale" in Sabine, *Collected Papers on Acoustics*; and two articles by Hope Bagenal, "Bach's Music and Church Acoustics," *Journal of the Royal Institute of British Architects* 37, no. 5 (1930), pp. 154–63 and

Our orchestral repertoire is largely standardized, and halls are manipulated to conform to an idealized acoustic concept, one dictated largely by the commercial utility of the space.

The renovations to the New York State Theater described above represent a continuation of our desire to rationalize the sound of concert spaces through the application of electronic rather than mechanical means. Rather than simply amplify the sounds produced on the stage, the goal of the State Theater's and other similarly sophisticated electronic sound systems is to alter, through invisible means, the acoustics of the performing and listening spaces.²¹ All of these systems use multiple stationary microphones and a large network of discreetly placed loudspeakers to subtly rework the acoustic characteristics of the architectural space itself (for both performer and listener) in a manner virtually unnoticeable to the uninitiated. For example, when the Brooklyn Philharmonic performs on the stage of the Brooklyn Academy of Music's Opera House rather than in the orchestra pit, electronic acoustic "redesign" "improves" the sound both for the ensemble and the audience, without any physical modifications to the hall. "The system has added an amazing amount of warmth to the orchestra and significantly altered the acoustics of the hall," said Mark London, director of capital projects at the Academy.²² Yet, small speakers and microphones were in place for two years before the audience and critics were officially informed of the presence of this electronic equipment. Although these additions created significant changes in the sound, their presence still flew beneath almost everyone's radar. Similarly, the previously problematic acoustics of the multi-use Hummingbird Center in Toronto, can now be "tuned" selectively for the acoustic requirements of any given performance such as spoken word, theatrical or opera productions. The space can be reprogrammed to suit better the program, even to correct for "bad" seats in the house. Such applications were benignly summarized by James Ireland, managing director of the Houston Grand Opera, which uses electronic enhancement at the Wortham Theater Center.

The climactic moments of a big Verdi chorus might be given a boost. Or a singer placed in a dead spot on a particular set might be highlighted a bit. We are not trying to make the sound louder. We just want to get that thrilling spiraling sound sensation of grand opera.²³

Though ostensibly on a mission of neutral refurbishment, the effect of this type of electronic restoration is to encourage and train listeners to decouple their experience of listening from physical, sonic reality, and to aspire toward incorporeal sensation. Rather than simply enlarging the controls over our acoustic environment, this type of manipulation challenges the imagined unity of our acoustic conception. We no longer

²⁰The Leipzig Tradition in Concert Hall Design," *Journal of the Royal Institute of British Architects* 36, no. 19 (1929), pp. 756–63.

²¹ Among the best known commercial systems to accomplish the type of sonic restoration described above are Acoustic Control Systems (which was responsible for the New York State Theater installation), Lexicon Acoustic Reverberation Enhancement System, or LARES (which is arguably the first such system), and System for Improved Acoustic Enhancement, or SIAP (which installed a system in the Vivian Beaumont Theater at Lincoln Center).

²² As quoted in Tommasini, "Enhancing Sound in a Hush–Hush Way." This article includes a discussion of the New York State Theater's, the Brooklyn Academy of Music's and the Hummingbird Center's use of electronic sound enhancement systems.

²³ As quoted in Tommasini, "Enhancing Sound in a Hush–Hush Way."

necessarily inhabit the same physical space as our music. Another example of this process can be seen in the marketing of V-Room technology, manufactured and distributed by the band equipment company Wenger, in partnership with the audio electronics company Lexicon. Installed in individual practice booths, classrooms and larger rehearsal rooms, these electronic systems (often with specialized enclosures) will coach a generation of musicians to make music in places where the "space," which can designate any size ranging from the actual dimensions (i.e., "off") to "enormous," is available on a switch by the door.

The room that makes practice a pleasure. Wenger's exclusive V-Room technology brings a practice room alive with real-world simulations that duplicate the acoustic [*sic*] of nearly any performance venue you can imagine. It lets musicians, teachers, and students switch the acoustic [*sic*] of their practice space as easily as changing channels on a television. Go from the acoustic response of a baroque concert hall to that of a 10,000-seat arena or a gothic cathedral with the push of a button. And it all takes place within the familiar time-proven sound-isolating environments you expect from Wenger.²⁴

We can no longer presume any "natural" correspondences between a given sound source and its position, the environment, and our own (i.e., the listener's) position. Instead, the acoustics of musical space is, in itself, an alterable element of the representational system within which musical meanings are constructed. Our vocabulary, an essential part of this semiotics of listening space, has expanded in very precise ways to meet this expanded capacity to control: we listen in the concert hall in terms of localization, envelopment, intimacy, clarity, presence, spaciousness, warmth, and brilliance. Through electronic intervention, each of these parameters may exceed the "reality" of the actual building; a huge concert hall with several thousand seats can now aurally designate an "intimate" acoustic experience, just as a booth barely large enough to hold a single practicing musician can now sonically signify a cavernous auditorium.

As we will see, this "surplus" in listening space is an effect accessible to all contemporary listeners due to our extensive knowledge of and experience with technologized, reproduced sound. It stands at the edge of our "normal" subjectivity as listeners, while in its extreme form, rendered sound, it is strongly allied with the processes of fantasy. We are increasingly transported not only through the medium of music and sound, but through the qualities and processes of its enclosures as well. As the Acoustic Control Systems promotional literature puts it: "Miracles only appear in fairy tales like *Alice in Wonderland*, where a simple spell changes rooms to any size. Today, however, it is quite possible to vary the acoustics of a hall from a small theatre to a large concert hall or even a cathedral."²⁵ The conceit is that, through audio technology, we can now design the spaces in which we consume music. However, the reality is "curiouser and curiouser"; rather than physically changing the room, it is our subjective experiences that are transformed through these encounters.

²⁴ The Wenger promotional brochure for the V-Room is available in pdf format at <http://www.lares-lexicon.com> (last viewed July 30, 2002).

²⁵ Acoustic Control Systems promotional brochure, available in pdf format at <http://acs-bv.nl> (last viewed July 31, 2002).

The Real and the Rendered

In the next section of this paper, I will take up two topics in relation to rendering. First, I will examine the material audio practices associated with rendering and suggest the ways in which rendering operates as an emerging semiotic system that competes with reproduction. I will then suggest that, since rendering promotes an interior, psychological register, a Lacanian perspective of these new meanings is necessary. Psychoanalytic theory sheds more light on how rendering produces meanings.

While reproduced sound and music are generally aligned with the accepted discourses of verisimilitude and fidelity, rendering, in contrast, indicates a challenge to the established and culturally determined practices of reproduction. Usually facilitated by technological innovation, rendering extends the reified cultural logic of "realness." It makes audible something previously "unhearable," something more "real" than convention can articulate. Rendering relies, as does reproduction, on the relationship between specific audio practices and the unique chain of signification it eventually engenders. Yet, rendering is contingent upon the development of new, historically-specific practices. Over time, the audience's understandings of particular audio practices change as ideologically informed modes of perception evolve. Today's rendered sound or music may become, through familiarity, tomorrow's cliché.²⁶ For example, since World War Two, technologies such as magnetic recording tape, stereophonic reproduction systems, and sensitive electric microphones—as well as the techniques that arose to employ these new tools—have engendered a new mode of listening. Below, I will examine the relationship between the manipulations of recorded sound and music made possible by these technological advances and the new meanings with which these practices are becoming associated.

In our post-World War Two era, rendering has been achieved through the manipulation of two aspects of a recording: proximity and spatial characteristics. First, a subtle but important form of rendering was associated with the development of the electric microphone and the practice of "close miking." By positioning the sound source as close as possible to a sensitive microphone, effectively eliminating any recorded ambience, this technique created the illusion of intimacy in the recording practices of crooners such as Bing Crosby, and was lampooned in *Singing in the Rain* by the "talkie" recording session in which the actress' heartbeat is recorded louder than the dialogue. "Close miked" recordings eschew verisimilitude in favor of the promotion of a psychological register: interiority, intensity, or sincerity (not to mention absurdity).

Michel Chion provides the following discussion of rendering in film:

²⁶ Rick Altman outlines a fascinating case study of the development of "proper" recording practice in the early sound period in Hollywood. He recounts the desire on the part of engineers and theoreticians to equate recording fidelity with correlated sound and image scales. In this cinematic representation of reality, the microphone should be faithfully associated with the camera position so that a sound emanating far from the lens sounds appropriately distant—as if the viewer shared the camera's auditory perspective. However, the triumph of narrative and its attending codes dictated the acceptance of quite the opposite recording logic. By the time this debate between practitioners was settled by 1938, blatantly mismatched scales came to be expected and accepted as the normative representation in cinema. See Altman, "Sound Space," pp. 46–64.

Consider a scene in Truffaut's *The Bride Wore Black*. Claude Rich plays a recording for his friend Jean-Claude Brialy in which we can hear a subtle sound of some kind of friction, unidentifiable and periodic. It leaves Brialy perplexed—he can't tell what it is. Rich then identifies the sound as that of a woman's stockings as she crosses her legs. He specifies that it was recorded without the knowledge of the woman in question. He adds that the lady was wearing nylons: "I tried it with silk stockings, but that didn't give a good rendering at all." What does he mean by "rendering," this character presented as a ladies' man?²⁷

For Chion, what is rendered or conveyed via the auditory channel (i.e., the soundtrack) in this scene by Truffaut is the tactile sensation of an anonymous woman's silk-clad legs rubbing together. Rendering is the process of "translating" one sensation to another.²⁸ However, Chion also asserts that the meaning of these rendered recordings point to an attendant psychological effect: sensuality, eroticism, intimacy, contact. What is critical here is the connection between the recording and playback techniques utilized to capture and listening to these sounds and the vicarious thrills evidently felt by these men on screen—and consequently, our identification with these characters' subject position.²⁹ The arbitrary association of sound source and interior effect—a very quiet, pulsed rasping signifies eroticism—is contingent upon the manipulation of the scale of these recordings. Our understanding of intimacy is an effect of our perception of our proximity to the sounds. This method of rendering sensuality is possible only because the recording equipment and techniques used by Truffaut (and Rich) are capable of capturing such small sounds to the exclusion of all other ambient noise. In addition to the equipment and techniques of "close miking," Truffaut's scene is reliant upon the introduction of Dolby and other noise reduction technologies in the 1970s, which Chion has claimed has radically changed our contemporary soundtrack through a "soft revolution."³⁰ Audio

²⁷ Chion, *Audio-Vision*, p. 110.

²⁸ Chion says of reproduction and rendering in general: "In considering the realist and narrative function of diegetic sounds (voices, music, noise), we must distinguish between the notions of *rendering* and *reproduction*. The film spectator recognizes sounds to be truthful, effective, and fitting not so much if they reproduce what would be heard in the same situation in reality, but if they render (convey, express) the feelings associated with the situation. This occurs at a barely conscious level...." (*Audio-Vision*, p. 109)

Thus, for Chion, reproduced sound is useful only to the extent that it also renders its source. If the actual recorded sound of a horse galloping doesn't also make you "feel" a thundering steed, then it is insufficient to generate anything meaningful in a soundtrack. Chion is reaching for terms that will account for the fact that most "realistic" foley in film is, in actuality, made by something other than the visually apparent, on-screen source. A recording of a gun shot is a reproduction, but a recording of an actual gun shot often offers a poor rendering of itself. A recording of two pieces of wood slapped together produces a more acceptable rendering of a gun shot. A classic comedic gag plays on this disparity. At the opening of the film *Monty Python and the Holy Grail*, an acoustically believable but unseen horse sounds as if it is galloping into view, only to be rendered ridiculous by a shot of a "knight" pretending to ride a horse while his squire pounds two coconut shells together. In Chion's taxonomy of recorded sound, rendering supersedes reproduction.

²⁹ The strikingly male subjectivity in this example by Chion points to an area of further research in regards to rendering and its relationship to fantasy. Many of the examples of rendering discussed in this paper might profitably be reconsidered from the vantage point of sexual differentiation. For a survey of the major theories of semiotics from a psychoanalytic and feminist perspective, see Kaja Silverman, *The Subject of Semiotics* (New York: Oxford University Press, 1983). Also, see her book-length study of film sound from the same perspective, *The Acoustic Mirror: The Female Voice in Psychoanalysis and Cinema* (Bloomington: Indiana University Press, 1988).

³⁰ See Michel Chion, "Quiet Revolution...and Rigid Stagnation," *October* 58, no. 2 (1991), pp. 69–80.

noise reduction technologies have further amplified our ability to zoom silently in—much like increasing the magnification of a microscope. Though we in the audience seemingly experience these recordings in their "second generation" (that is, as the theatrical playback of the diegetic playback of Rich's tape recordings), the recordings of leg-rubbing retain a cozy proximity that might only be physically experienced if we, in the audience, collectively had our heads on the woman's lap. Rendering is accomplished through our skill at recognizing the manipulated magnitude of what is recorded in relation to its "original" scale and distance, and our ability to draw appropriate conclusions about what this mismatch signifies.³¹

Recording equipment and techniques that allow for the arbitrary control of the spatial characteristics of recording are the second development associated with rendering since World War Two.³² Stereophonic sound and magnetic recording were instrumental in the production of long-playing records (LPs) in the later 1950s, and often included wild (and contentious or humorous) experiments with the spatial positioning of sounds across the stereo field. Music as diverse as Spike Jones' comedy recordings and prestigious new productions of Wagner's "*Ring*" used these new techniques to create recordings that rendered new spaces.³³ Early stereophonic films often evoked unusual and fantastic spaces that required an equally new mode of audience understanding. These same technological innovations were associated with several different widescreen processes in the early 1950s, and allowed the construction of soundtracks that could suggest spatial environments completely different from the the space of theatrical exhibition. Placement and movement of sounds within the field of the loudspeakers could render spatial positions to an extent impossible with older monophonic recording methods. For example, using multiple loudspeakers in the theater, the soundtrack of the earliest Cinerama demonstration film moved the sounds of a roller coaster, screaming riders and all, from left screen to right and even out into the loudspeakers at the sides and rear of the theater.³⁴ In this way, the soundtrack could render for the audience the thrilling spatial experience of the riders. Similarly, multi-channel playback systems could render the diegetic space of a conversation by moving dialogue from speaker to speaker as characters moved across screen. Magnetic tape facilitated these previously impossible production techniques. Audio engineers could create a finished soundtrack as a composite

³¹ Rendering through magnitude cues is a practice relative to the conventions of reproduction. After living with manipulated magnitude scales for more than half a century, we now regularly accept sounds and music with slightly exaggerated scales as "real." Only truly exaggerated scales will be interpreted by audiences as rendering.

³² My article-in-progress, "In Full Stereophonic Splendor: (Surplus) Fantasy, Space and Recorded Sound in Film and at Home, 1953–1958," analyzes stereophony in cinema and the home markets through the 1950s and the implications on spatial thinking. Also, see my "Stretched from Manhattan's Back Alley to MOMA: A Social History of Magnetic Tape and Recording," in *Music and Technoculture*, ed. Rene Lysloff and Leslie Gay (Hanover: Wesleyan University Press, 2003), especially the discussion of contemporary aesthetic categories of realism and romanticism, and their relation to different recording techniques.

³³ For example, producer John Culshaw's monumental first complete stereophonic recording of Wagner's "Das Rheingold" with Georg Solti conducting the Vienna Philharmonic (London: London, 1958)—which "meticulously followed Wagner's original stage directions...thus Wotan and Loge move off to the audience's right when they descend to Niebelheim at the end of Scene Two, and re-emerge from that direction at the opening of Scene Four." (from Culshaw's notes to the boxed set). I discuss Culshaw, Jones and additional examples more fully in my paper, "In Full Stereophonic Splendor."

³⁴ See John Belton, *Widescreen* (Cambridge, MA: Harvard University Press, 1992).

of many smaller recorded pieces, both because magnetic tape was a flexible editing medium, and because of the high quality (i.e., "fidelity") of the media. As with manipulated proximity, rendering is accomplished through our skill at recognizing the manipulated spatial characteristics of what is recorded in relation to a "normal" positioning, and our ability to draw appropriate conclusions about what this mismatch signifies.

As codes for reproduction were slowly settled, utilization of the spaces off the screen, as well as to the sides and the back of the theater, were reserved for the extraordinary practices of rendered sound and music. For example, in the name of intelligibility, the convention of presenting dialogue from the stationary, center channel was quickly reasserted, eschewing the newly possible spatial effects for most spoken word situations. The surround channels in theaters since the mid-1950s have been reserved almost exclusively for sound effects. Much like the contemporary "electronically enhanced" concert hall, cinema has developed a capacity through technological innovations to represent proximal and spatial experiences, either to reproduce their familiarity and intelligibility, or to render new experiences.

In fact, the proximal and spatial signatures of live sounds are exactly those characteristics also manipulated by sound-enhancement systems in live performances. Often, these manipulations are subtle enough to pass by the uninitiated unacknowledged, and thus the illusion of a "non-enhanced" concert is preserved.³⁵ That is the stated objective of the creators of these systems. However, live processing of sound can also produce strikingly noticeable result—a decipherable rendering. Though the tell-tale signs of amplification may be absent, the discerning recognize a distortion of reality, and critics will sound an alarm. In 1999, Sir Richard Fairman warned his readers of the "conspiracy of silence" going on in the world's opera houses.

The issue is the use of electronic "sound enhancement" systems. The next time you go to the opera, listen carefully for the tell-tale signs. Is it hard to pinpoint where the singer is standing? That probably means enhancement is diffusing the sound. Are the words fuzzy? That is due to the added resonance.

My first experience of a sound system at the opera was an unhappy one. This was at the 1996 Maggio Musicale in Florence, when Claudio Abbado and the Berlin Philharmonic Orchestra gave what should have been a stunning performance of Strauss's *Elektra*, if only the technicians had not twiddled the controls up too high. The sound picture was bizarre: the orchestra sounded as if it was playing in a church and the singers were disembodied phantoms singing from somewhere up in the roof. The performance had been ruined by insensitive technical manipulation. I said so in the Financial Times and received a pained letter back from the Maggio Musicale, enclosing a colour brochure on the Philips MCR system (Multiple Channel amplification of Reverberation). The system had been inaugurated in 1990 and came with the imprimatur of Zubin Mehta; but having experienced it live, I cannot say that cut much ice.³⁶

³⁵ Especially in the opera world, the debates over amplification of the human voice are strongly reminiscent of the drug "enhanced" performance controversies in professional and Olympic sports. The purity and essentially human character is called into question by the electronic and chemical "enhancements."

³⁶ "Discord runs through the sound of music: It is meant to improve the acoustic, but electronic 'enhancement' can ruin a good night at the opera." by Sir Richard Fairman, Financial Times (London), June 26, 1999. Arts, p. 7.

Fairman has identified several problems here: mismatched spatial and proximal cues. The music's scale is wrong, its apparent source in the hall is odd in relation to the human performers, and it seems to inhabit a space other than the audience's. But what is crucial here for us, the listeners, is the disruption of reality these (seeming) miscalculations provoke: the broaching of the borderline that separates the outside from the inside. Though by convention, we understand musical expression as emanating from within individuals (composers, conductors, and performers), our access to it as auditors comes only from the "outside," that is, from the concert hall. In this sense, the concert hall and the figure of the performer are the containers, convenient measures for our musical reality. The concert hall is the very field of communication *qua* meaning. A concert is usually a reassuring manifestation of the Lacanian symbolic. It is reproduction that encases music's operations within a well-understood discursive network. The concert hall and its rituals embody the social bonds of music making. For the listening subject, the "reality" of the concert enforces the distance, consistency, and protection required to maintain an imagined unity, the maintenance of the listening subject's "insides" and "outsides."

But what can explain the inversion of proportion in this rendering of music, where the inside greatly exceeds the outside, where the music produced has exceeded the producers of the sounds, overrun the concert space, and has oozed beyond the boundaries of our expectations? This surplus of inside is, of course, fantasy space—the staging of our desires. The audible, rendered substance itself, the music that is cast upon this screen, is an expression, a symptom, of the listener's fantasy. However following Lacan, what fantasy designates is not a scene in which these desires are fully satisfied, but one in which they are given coordinates and attached to specific objects. The concert hall and its performers function as "objects small *a*," voids around which symbolization aggregate and are set in motion. Fantasy has the aim of staging our desires but, at the same time, confirms the subject's lack, the listener's "impossible" relation to object small *a*. In Žižek's reformulation of Lacan, fantasy is "the imaginary scenario that, by means of its fascinating presence, curtains the lack in the Other, the symbolic order, its inconsistency, i.e., a certain fundamental impossibility implied by the very act of symbolization."³⁷ This explains why, rather than persisting as an antiquated token of an earlier industrial society or as a reified fixture of the ideological state apparatus, the concert hall continues to be a captivating site for the generation of contemporary musical meanings.³⁸ As Žižek notes, "through fantasy, we learn how to desire."³⁹

What is the nature of this desire, our desire? At this point, it must seem that the contents of fantasy rendered by concert performance are necessarily pathological: a performance by disembodied, flying phantoms. Herein lies a basic paradox—true both for our simulacra of concerts as well as in our actual electronically-enhanced concert life. By imagining a pathological kernel at the heart of concert production, a musical object is produced that promises to preserve music's utopian potential and exceeds its reified and

³⁷ Žižek, *Looking Awry*, p. 133.

³⁸ See R. Murray Schafer, *The Tuning of the World: Toward a Theory of Soundscape Design* (Philadelphia: University of Pennsylvania Press, 1980) for a discussion of the nineteenth-century orchestra as modeled on the social relationships of the industrial factory. The term "ideological state apparatus" is taken from Louis Althusser, "Ideology and Ideological State Apparatuses (Notes toward an Investigation)," in *Lenin and Philosophy and Other Essays*, (New York: Monthly Review Press, 1971), pp. 127–186.

³⁹ Žižek, *Looking Awry*, p. 16.

commodified form. Although functioning as a support within media, fantasy is at the same time the leftover of the real that enables us to "pull ourselves out," to preserve a kind of distance from the socio-symbolic network.⁴⁰ For listeners, this rendering of a concert experience is "the kernel of enjoyment that simultaneously attracts and repels us."⁴¹

Rendering our fantasy of musical performance

In the final section of this paper, I will suggest that fantasy expressed through rendering can structure our experience of both recorded music, as well as contemporary concert life. In situations where the audience members are at home listening to their stereos, as well as when they are seated in a real concert hall, a logic of electronic mediation dominates our listening habits. The boundaries between reproduction as a manifestation of the symbolic order on the one hand, and rendered sound and its operations as a fantasy space on the other, are regularly redrawn through the intervention of new technologies: our fantasies of the concert hall rely upon three operational assumptions. First, the rendered moment is contained within a larger narrative frame, one predicated on the conventions of reproduction. Second, the figure of a performer, a human sound source, embodies a pathological subjectivity. Finally, the scale of sounds, their spatial and magnitude characteristics, manifest a "surplus" which is manipulated to suggest a seemingly impossible sonic environment, an unconventional treatment of space and time. I will use a recording from 2001, a composition written for a live performer with electronics, and a work of electroacoustic music to explicate further each of these categories.

The thirteenth and seemingly the last cut on *The Id*, the 2001 album by Macy Gray, that freaky Top-40, nu-soul diva, is strikingly different from everything else on her compact disc.⁴² Just over a minute long, it is a collage of music and noise. It begins (see Example 1, 0:00-0:19) with a slow fade-in which reveals a rocked out ensemble already in full groove: a rhythm section of bass, drums, and additional percussion lay down a steady beat; an electric guitar with a wah-wah pedal wails plaintively on top, a saxophone and a trumpet trade a simple accompanying phrase, and a turntable scratches just under the musical surface. After peaking in a crescendo (0:09), the ensemble falls back in volume to allow a bass clarinet solo to emerge. But the texture quickly becomes fragmentary as bits and pieces of the ensemble swell and wane (0:09-0:38). Each of the instruments, in turn, seem to bubble up to the surface, swirling around between the left and right channels, only to fade back again into a meterless stew. The texture gradually thins (0:38-0:48), and eventually, noise (digital noise, at that) predominates (0:49). At the end (0:49-1:07), a pulsing gesture composed entirely of distortion recapitulates the opening by fading out and then back in again, ending loudly. Example 1 provides a schematic analysis that plots several dimensions of change over this short piece: from metered to unpulsed, from dense to thin textures, and from high to low frequencies. However, only a devoted formalist could hear this composition as a simple organization of musical elements and be satisfied. The meaning and very presence of a tune entitled

⁴⁰ Ibid., p. 128.

⁴¹ Ibid., p. 133.

⁴² Macy Gray, *The ID* (New York: Sony Music Entertainment, 2001).

"blowin' up your speakers" remains a question in the midst of the rest of this CD, which is admittedly off-kilter but largely convention-driven radio fare.

In an interview available on her web site, Gray explains its origins in this way:

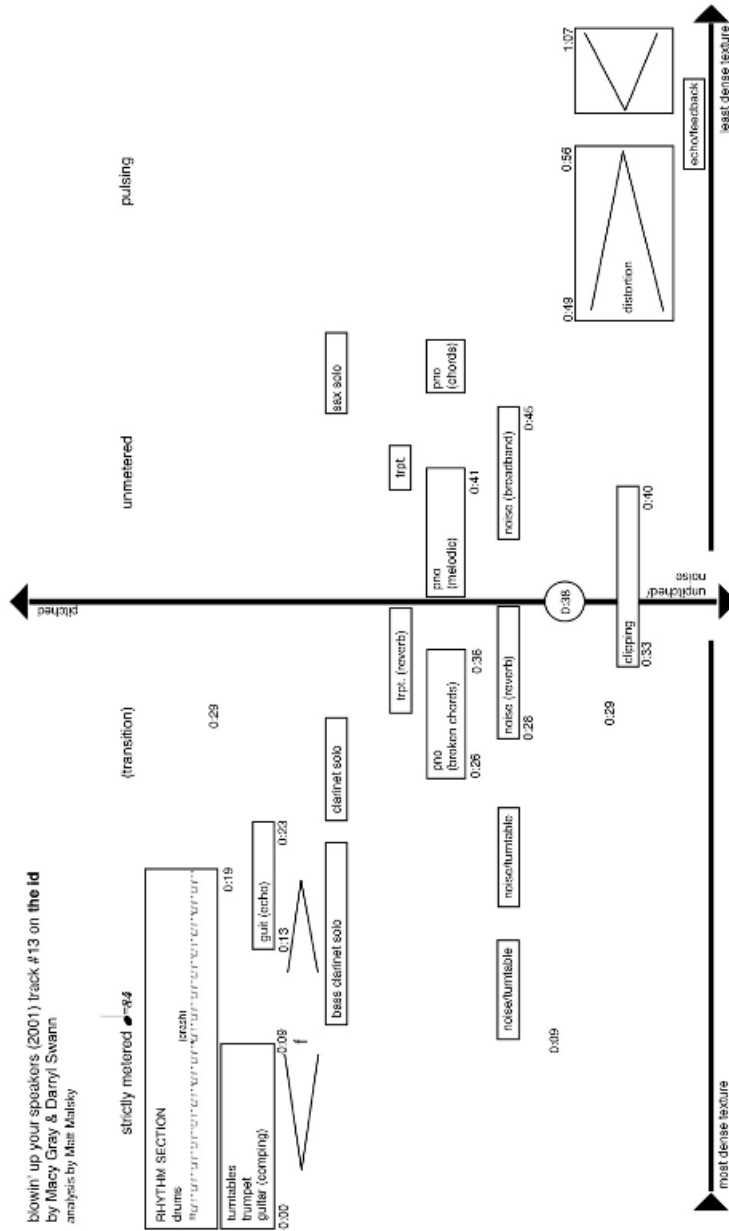
[...]thousands of little nerdy engineers put out my [mumble...] You know, the people on my record went through... They just kind of wanted to have some fun. And being the nice person that I am, I let 'em.⁴³

In her inimitable fashion, Macy Gray identifies this music with excess, with some small bit of administrative indulgence at the edge of an otherwise highly rationalized production process, and with the assertion of her own Id.⁴⁴ While the other vocal-oriented tracks on this album may evade the constrained vocabulary of pop music in small ways, this "music" is beyond the pale. The means for the onslaught is familiar enough: quotidian instrumental sounds and noises with proportional volumes, proximities and spatial positions which are decontextualized. But how does this rendered music fit here? It is, seemingly, the crazed noise of non-music "tagged on" to the end of the album as an afterthought, a dangerous supplement (at least to our sound systems) that its creators—musicians, sound engineers, and producers—had fun making.⁴⁵ Yet, in its status as pleasurable surplus, this track invites us to ask an obvious and leading question: what do we, as listeners, get out of "blowin' up our speakers?"

⁴³ <http://www.macygray.com/>, interview fragment in RealAudio format, rtsp://dinys4607rm.fplive.net/sonymusic/MacyGray/blowinupyourspeakers_mono.rm, last viewed on January 2, 2002 but no longer available.

⁴⁴ For an entertaining discussion of the irrepressible aspect of Gray's public persona, see Joey Sweeney, "What's Eating Macy Gray? Why Is the Stoner Soul Diva Faking the Freak?" www.salon.com (last viewed July 31, 2002).

⁴⁵ See Stan Link, "The Work of Reproduction in the Mechanical Aging of an Art: Listening to Noise," *Computer Music Journal* 25, no. 1 (2001), pp. 34–47 for a discussion of the role of noise in contemporary recording.



Example 1

To claim that this track on the CD participates in the cultural fantasy of the concert hall is to assert the priority of a mode of listening dominated by electronic technology. If, by gathering together in a concert hall, we participate in a collective ritual—Benjamin's "simultaneous community experience"—that is increasingly organized by electronic manipulation, then what separates this type of listening—designated "live"—from exclusively electronic mass cultural products? Music heard via surround-sound-equipped home theaters, portable stereos (Walkmans, DiscMans and mp3 players, etc.), the telephone (while on hold), programmed music in public spaces (i.e., Muzak), satellite radio, car stereos, surfed web sites, video games, children's toys, or even greeting cards

might all be described as an "asynchronous community experience" in which we're all listening to the same things—all products of the culture industry—in the same electronically mediated ways, just at different times. As with Benedict Anderson's "imagined community" of readers, disparate listeners congregate in a realm made possible by electronic transmission and dissemination to hear the same music. Thus, a network of producers and consumers can participate in a shared perspective or pursue a common goal.⁴⁶ Underlying Macy Gray's track is an assumption that, as a community of fans, we're listening together, and thus the compact disc is a simulacra of that archetypal communal musical experience, the concert.

But like a concert, the meanings generated by any given moment are part of a larger experience which is organized externally (by star performers, studio musicians, conductors, composers, recording engineers, producers, record company executives, etc). Although we can start and stop a CD, there is a logic in the arrangement of its elements (i.e., songs), and their continuity affords meanings through juxtaposition. Up one "level" from this individual track is a grouping of three cuts that run together continuously on the *The Id*, without any pause: "forgiveness" is followed by "blowin' up your speakers" which is followed by an unnamed Easter egg—a bonus track not announced on the jewel case.⁴⁷ In fact, the "degenerative" aspects of "blowin' up your speakers" become more understandable in the context of the music that immediately surrounds it. The second half of "forgiveness," entirely instrumental, has evidently provided the "raw materials" for the construction of its *musique concrète*-inspired reinterpretation in "blowin up your speakers." "Forgiveness" ends with a slow fade-out, and the initial ensemble section of "blowin' up your speakers" is a fade-in that continues the same instrumental music without dropping a beat.⁴⁸ In this way, a more "normal" track prepares the unconventional by supplying a frame of reference. Moreover, the untitled, hidden final track that follows "blowin' up your speakers" completes the frame. Considered in this intermediate position, the sonic interlude of "blowin' up your speakers" is an extra-verbal, self-cleansing absolution that falls between a plea for the "forgiveness" that can be granted only after "all my lies are shed"—the refrain of the bonus track. The narrative frame of "forgiveness" and the final, untitled cut provides a context for us to understand the intervening rendered music. Our speakers may be blown up by the intervening sonic excess, but we'll endure because this "surplus" points to an outpouring of truth and honesty previously inexpressible.

It is the figure of Macy Gray herself who is the source of all this honesty, or at least with whom we, the listeners, cathect. The second requirement of our rendered musical moments is a motivating human subjectivity. The figure of the performer is a necessary catalyst, an empty form filled out by everyone's fantasy. In this instance, the vehicle is a familiar one—the celebrity status of Gray herself. This larger-than-life personality, informed by her musical persona, but also supplemented through concerted

⁴⁶ Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso, 1991).

⁴⁷ Though there is no silence between "forgiveness" and "blowin' up your speakers," each is given its own name on the CD liner. Each has a separate index number and is independently selectable on a CD player. The term "Easter egg" is commonly used to describe an unadvertised feature in computer software or on a DVD.

⁴⁸ To my ears, this dramatic fade out-and-in (within a single cut) is an inter-textual reference to the Beatles' tune, "Helter Skelter," on *The White Album* (London: Apple Records, 1968).

marketing and critical exposure in the popular press, is synonymous with the expressive source of this music.⁴⁹ Even when Gray isn't performing and has even disavowed responsibility for "blowin' up your speakers," she is an absent presence. Described as "an heiress to all the soulful sass and witty melancholia of Billie Holiday; the black Dorothy Parker," Macy Gray galvanizes our attention on the inaccessible, abstract emotive outpourings implied in "blowin' up your speakers" through her all-pervading presence on the album as a "straight shooter," an almost pathologically unpredicable interviewee (who once unexpectedly announced that she wanted to punch Mariah Carey), an emotionally unguarded mystic guru.⁵⁰

Even in instrumental music, the subjectivity of a performer is necessary to rendering. Several recent film biopics of famous performing musicians reinforce this point. In *Hilary and Jackie* (Tucker, 1998), the critical moment of narrative disclosure for Jackie occurs on stage during a concert—and not in bed with her brother-in-law, as might be tempting to suggest. While performing, Jacqueline Du Pré, the renowned cellist and title character, unexpectedly seizes. First, she loses physical control of her hands, and, by the conclusion of the concert, she is so immobilized that she can't even stand up to take a bow. The sonic results are a startling rendering of the music. Moreover, while the sounds of this performance manifest her physical symptoms, they also classify her psychological state. In place of the "reality" of a concert, what is rendered here is the Lacanian real itself, Jackie's real, "the pulsing, presymbolic substance in its abhorrent vitality."⁵¹ Insuperable as fantasy, the real suddenly and traumatically "returns" as an inescapable symptom that cannot be dissolved through interpretation.⁵² This rendered "music" is the utterance of a subject who "loves her symptom more than herself." It is the

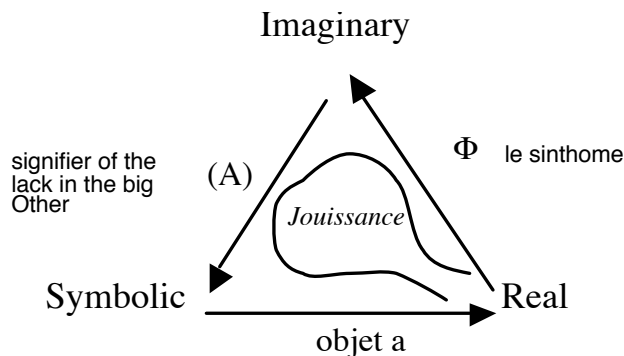
⁴⁹ Before her first album, *On How Life Is*, was released, Gray had already appeared on "Late Night With David Letterman," had a trendy video in rotation on MTV, and been featured in the *New Yorker*. Even more than the outrageous subjects of some of her songs (e.g., "gimme all your lovin' or I will kill you"), critical debate has focused on her authenticity as an expressive voice: is she for real, or just another "new soul pretender?" See the review by Kandla Crazy Horse, "I'm the Lamest Craze: Macy Gray Is Nothing but a New Soul Pretender," www.salon.com, (last viewed on July 31 2002; updated 2001).

⁵⁰ Sweeney, "What's Eating Macy Gray?" www.salon.com.

⁵¹ Žižek, *Looking Awry: An Introduction to Jacques Lacan through Popular Culture*, pp. 14-15.

⁵² *Ibid.*, p. 137.

For more detail on the workings of Lacanian object logic, see Lacan's schema see page 90 of his *On Feminine Sexuality, the Limits of Love and Knowledge: The Seminar of Jacques Lacan, Book XX, Encore*, trans. Bruce Fink (New York: W. W. Norton & Company, 1975).



materialization of a terrifying, and impossible *jouissance*. Jackie both despises her musical talent and its responsibilities, and can't imagine an existence without her cello. It is her music that makes Jackie extraordinary, and through the music, Jackie constitutes herself. In this traumatic moment we see that Jackie's identification with her symptom is the only substance, the only positive support of her being, the pathological singularity that guarantees consistency to her as a subject. In other words, the Lacanian sinthome.

The climactic concert scene from the movie *Shine*, which features the pianist David Helfgott, is similarly organized. During the concerto competition at the Royal Academy of Music, Helfgott has a breakdown while performing a Rachmaninoff piano concerto—his father's favorite work. The rendered version of the music associated with his collapse is the Oedipal conflict he has endured made audible. Helfgott's tortured interior register, previously displayed through the reproductive means of narrative, is finally revealed through Helfgott's own most effective expressive means, playing the piano. The full extent of the psychological damage he has suffered at the hands of his father is finally evident. What all these characters—du Pré, Gray, and Helfgott—share is a pathology that is manifest as an excessive internal condition. Musical rendering is necessary to articulate the excesses of their subjectivity.

However, if no such "personality" is literally available, we can fill in the gaps. Consider the live clarinetist in Pierre Boulez's *Dialogue de l'ombre double*, who remains anchored to the stage throughout the performance of the piece while an electronically manipulated "shadow" whirls about the audience through a circle of loudspeakers at the periphery.⁵³ Rami Levin describes the piece as follows:

Dialogue de l'ombre double is a striking and dramatic piece. There are lyrical and brusque sections, leisurely and frenetic moods, pulsating rhythms and sustained passages, singing lines and raucous multiphonics and fluttersong pitches, mellow and shrill phrases, creating a variety of musical characters all within a fifteen minute work.⁵⁴

These characteristics, while they seemingly describe the music itself, are embodied by the physical presence of an instrumentalist: the clarinet performer. Of course, when performers appear as interpreters, we accept that they are bringing to life ("sounding") the expressive potential of a written score. As directed by the notation, it is the character portrayed by the clarinetist who is alternately lyrical and brusque, raucous, singing, mellow, etc. By convention, the subjectivity represented in a performance of classical instrumental music is a fusing of the divided labor of production: composer and performer. However, in this instance the addition of an electronic clarinet alter ego—a McLuhanesque extension—shifts the role of such a "character."⁵⁵ The figure of the live clarinet, an anchor in "human" scale, provides us with a narrative frame—the normative operations of concert life, while its shadow renders the expressive potential beyond the bounds of an embodied performer. Boulez writes in the instructions to the score, "To enhance the contrast between live and pre-recorded sections of the work, lighting effects can be used during the performance." The performance instructions go on to suggest that

⁵³ Pierre Boulez, *Dialogue De L'ombre Double* (Paris: Universal Editions, 1985).

⁵⁴ Rami Y. Levin, "Boulez's *Dialogue De L'ombre Double*: Origin and Analysis" (Thesis for the Ph. D., University of Chicago, 1991), pp. 2–3. I thank Professor Levin for providing me with a copy of her work.

⁵⁵ See the classic study of the effects of technology on human expressive potential, Marshall McLuhan's *Understanding Media: The Extensions of Man*, 2d ed. (New York: Penguin Books, 1964).

the clarinetist, placed in the middle of the hall, be fully lit when playing, but disappear into darkness when the electronic shadow takes over. The "live" and the "shadow" never play together for long, but rather always alternate human "strophes" with pre-recorded "transitions." Something like a normal concert is manifest when the human clarinetist plays. But during the musical seams, when the electronic clarinet takes over, we leave the concert hall behind, close our eyes, and engage in fantasy.

While the sound of the live clarinet remains unprocessed and "naturally" present in the concert hall, the spatialization of the pre-recorded clarinet "shadow" undergoes fascinating transformations. Through the course of the playback of each pre-recorded section, the sound is redirected to one or more of six loudspeakers placed equidistant around the audience. Rami Levin has convincingly demonstrated that the paths around the hall, the patterns created by speakers turning on and off, are partly determined by inter-parametric parallels: spatialization and pitch set organization are controlled by the same (abstract) series.⁵⁶ Thus, musical space is rationalized—on paper anyway—to the degree we would expect from Boulez. However, this accounts for neither the audible effect of this process of spatialization, nor the intended dialogic relationship between "shadow" and figure—the controlling metaphor for the composition.

For example, in the opening portion (called the "sigle initial" or initial acronym), twenty-six musical phrases for pre-recorded solo clarinet are divided into four groups by the actions of the spatialization.⁵⁷ With each of the first eight phrases/cues, the pre-recorded clarinet jumps suddenly and irregularly around the circle, appearing in only one speaker at a time. My analysis (see Example 2, section 1, "single speakers as sources") represents the concert hall with loudspeakers numbered according to Boulez's indications. Each phrase/cue is represented by a number (1 to 8). An encircled "s" indicates the position and relative size of the "image" of the pre-recorded clarinet. In cues nine through sixteen, the "shadow" appears simultaneously in two speakers at a time (see figure 2, "stereophonic pair as source"), and then in three speakers at a time in cues seventeen through twenty (see figure three, "speaker 'triplets' as source"). In each of the last six phrases/cues (numbers twenty-one to twenty-six), the number of active speakers expands quickly from one to all six (see figure 4, "progressive spatial enlargement"). Thus, the "shadow" begins the piece extremely quietly and *mystérieux* and moves around the perimeter of the hall before it gradually begins to occupy more "space." There is remarkable consistency in the motivic material throughout the "sigle initial," and even into the start of the first strophe where the "real" clarinet seamlessly takes over. Throughout the opening twenty-six phrases/cues, the spatial manipulations of the "shadow" have dominated our attention, moving fantastically around the room and slowly drawing our attention toward the center of the hall where the live clarinetist will eventually be revealed (both sonically and visually). When the lights come up and the live clarinetist begins to play the first strophe, the portrait of a composite clarinetist is completed. Taken as a whole, the section introduces the musical "character" of a single clarinetist who is bipartite: a "real" person along with an electronic, excessive remainder that operates beyond the human figure.⁵⁸ There is, in this single actor, one who

⁵⁶ Levin, "Boulez's *Dialogue De L'ombre Double*," esp. pp. 32–33.

⁵⁷ See Example 3 for a schematic representation of the spatial motions in this section.

⁵⁸ There is further evidence in the instructions to the score that Boulez conceived of the two, live and electronic, as continuous. It is the composer's preference that the live performer prepare his/her own tape

participates in a normative "new music" concert drama (i.e., performed according to the codes of reproduction). However, there is also a pathological extension who can whirl around the room, exercising heretofore unknown expressive potential. Later in this paper, I will discuss the discrepancy between the effects Boulez seems to aspire toward in the use of loudspeakers described above and the limitations imposed by the technology available to him.

The treatment of spatial and magnitude cues of individual sonic elements is the third and final aspect of rendering that I will examine. Rendered music consists of sonic elements whose proximal scale and position in space has been manipulated. Though the sources of the rendered music may be identifiable, these raw materials are sounds divorced of their mimetic responsibilities. They are created in the intermediary stages between "live" performance and electronic manifestation. Since World War Two, the category of post-production—(re-)recording, processing and then combining (i.e., mixing) sound into a final product—has conceptually separated the act of performing, of making sounds, from their presentation as rendering.

The working methods and techniques used to produce rendered sounds define the processes of the commercial recording studio, where even "live" recording sessions are followed by post-production work and mastering. As a general rule, "effects" and "mixing" are considered and applied outside the time constraints of performance. Most commercial recordings are "multitracked." The elements are assembled according to a working schedule which allows a degree of review and reflection previously associated with composition. This brief description from the monthly feature "Single Slice" in *Pro Audio Review* is representative:

But like many hit songs, [Puddle of Mudd's] "Drift & Die" went through a mighty metamorphosis before the public got a first listen. When it was first tracked, lead singer Wes Scantlin made sure there were plenty of extra elements for Kurzweg [the producer/engineer for the album] to play with to build the song. "It literally existed in several forms for a few days," he explains. "The first thing I did was sneak the drums in sooner, and make parts of the backing band a little less repetitive. Then we added a lot of vocal overdubs throughout; there were a lot of things in Pro Tools to fool around with."

Kurzweg also added a sampled cello and, to boost the center guitar solo, ran it through any number of effects, including a "wah-wah," to make it more unique.⁵⁹

The contemporary recording studio is like an Erector set that uses malleable bits of audio for girders. To start, instruments and voices are recorded and re-recorded in excess of what will eventually become the final work. These stored elements become building blocks to be moved around in relation to each other, edited, discarded, or supplemented with more recordings. The various quantifiable characteristics of each sound, the spectral traits, spatial position in the stereo field, and relative loudness are altered to conform to an overall plan which promotes the type of reproductive coding already discussed and hides the labor necessary for its construction.⁶⁰ In listening to the instrumental ending of Macy Gray's tune, "forgiveness" (which is also the opening of

recordings for performance to preserve a consistency of tone quality and performing nuance between live and pre-recorded clarinet parts.

⁵⁹ Chuck Taylor, "Puddle of Mudd's 'Drift or Die,'" *Pro Audio Review*, August 2002, p. 18.

⁶⁰ See Paul Théberge, "The 'Sound' of Music: Technological Rationalization and the Production of Popular Music," *New Formations* 8 (1989), pp. 99–111.

"blowin' up your speakers"), for example, we in the audience cannot hear the process of creation that was necessary to build the end product. The individually recorded and processed tracks have been combined to create the illusion of a coherent, though wholly imagined physical space. Each soloist—bass clarinet, trumpet, and guitar—takes center stage in turn and is supported musically by a drum kit which is stretched widely across the back of the performance space, the "stage" between the stereo speakers. The guitar is on the left (though it occasionally flits across to the right rear) and the piano is on the right in front of the drums. As listeners, we are eager participants in the conspiracy to invent a concert stage where none existed in production. We integrate disparate audio elements to participate in a narrative re-organization of these sounds, as if electronic reproduction is an extension of a live performance. Under the controlling influence of Gray's personality, we willingly hear instrumental lines as "characters" with a position in space and consistent sonic individuality. It is only when these same elements return rendered, divorced from their reproductively defined relationships, that we can hear and reconsider their participation in the conventions of recorded sound. What strikes us as disorienting in "blowin' up your speakers" is an absence; by upending the relative magnitudes and spatial positions, we leave the familiar boundaries of recognizable, feasible bodily experience, or what we have thus far accepted as the reproductive norm. Thus, the Erector set of the modern recording studio can be used to create both reproduced and rendered music, to approximate either a building by I. M. Pei or by M.C. Escher.⁶¹

To return to an earlier example, Boulez's *Dialogue de l'ombre double* is a composition that, through the application of new technology to manipulate the proximity and scale of the pre-recorded clarinet part, altered the boundary between reproduced and rendered concert experiences. Boulez's achievement was to imagine a rendering of music for clarinet with electronics that was not yet technologically possible when the piece was first conceived and realized in 1985. It is only in the context of subsequent research into the considerable technological requirements necessary to produce spatial effects through multiple loudspeakers that the limitations of Boulez's technological means in *Dialogue* has become evident. The spatial position and image size of the pre-recorded clarinet are critical to Boulez's intentions. My analysis hypothesizes that an audience would perceive the electronic manipulations of the pre-recorded clarinet as changes in location and dimensions (or "image size"). By directing the pre-recorded clarinet to individual and sets of loudspeakers, the perceived dimensions of the electronic clarinet would increase as it moved from the hall's periphery to the center. While the type of stereophonic field in the Macy Gray tune has, by now, become familiar enough to become "inaudible," the desired effects in *Dialogue* were more experimental.⁶²

⁶¹ There are, of course, a wide range of approaches to placing recorded elements within a stereo array. For an unusually analytic approach to the techniques of commercial audio production, see William Moylan, *The Art of Recording: The Creative Resources of Music Production and Audio* (New York: Van Nostrand & Reinhold, 1992). For a more technical discussion, see David Moulton, *Total Recording: The Complete Guide to Audio Production* (Sherman Oaks, CA: KIQ Productions, 2001).

⁶² The technology for this composition originally utilized a specialized digital audio application developed at IRCAM for the 4X computer. In 1989, Howard Sandroff (director of the University of Chicago Computer Music Studio) became the first internationally to adapt commercial hardware and software to the task. Sandroff and his clarinetist partner, John Bruce Yeh (Chicago Symphony Orchestra) subsequently performed the work many times. They also commissioned a work from me, *Ancient Devices*, that used the

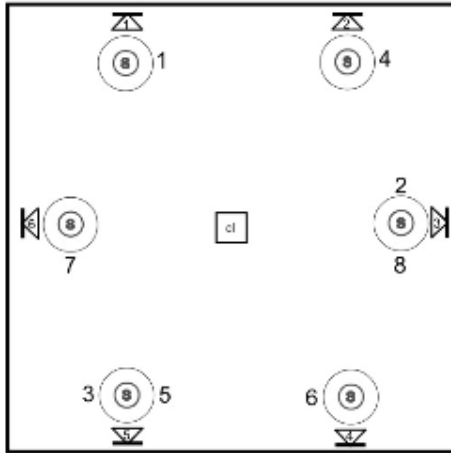
As the following review of Boulez's instructions will show, the gap between his conception and the available means to realize that conception is meaningful and productive. The first group of phrases/cues (see Example 2, figure one) places the pre-recorded clarinet in single speakers at a time. Emanating from point sources, but never moving between contiguous speakers, the pre-recorded clarinet's changes in position can only be perceived as jumps across the room. The location of the clarinet is synonymous with the speaker position. Rather than moving smoothly around the periphery of the concert hall, the pre-recorded clarinet "transports" impossibly across the room with each new phrase/cue. In the second set of phrases/cues (see Example 2, figure two), the clarinet always appears simultaneously in a pair of speakers which are theoretically capable of creating a stereophonic image with an apparent location in the plane between them. In my analysis, I've indicated this potential to move the pre-recorded clarinet outside the immediate field of each speaker by positioning the encircled "s" between speaker pairs. However, in reality the source recordings are specified as monophonic; there are no processing instructions in the score to synthesize the necessary localization cues. Furthermore, not all speaker pairings even create a usable horizontal plane. Thus, rather than a specific spatial position and image size, the pre-recorded clarinet in these phrase/cues is perceived more as a diffused image with slightly more volume. The remaining phrases/cues are still more problematic. In the third set of phrases/cues (see Example 2, figure three), rather than a more centralized and larger pre-recorded clarinet, the phrases/cues utilizing "triplets" of speakers create, in practical effect, an even more diffused image with the volume increasing only slightly (exponentially less with each additional loudspeaker). Finally, in the fourth set of phrases/cues (see Example 2, figure four), each additional loudspeaker will amplify the impression of a non-localized pre-recorded clarinet without any specific point of enunciation. This analysis of the "single initial" is further complicated by the ambiguities of concert hall acoustics and the effect of audience position within the hall on spatial perception. The diagrams in Example 2 assume an idealized listening environment in which every audience member shares the same point of audition. In actuality, a universal "sweet spot" is still an impossibility. The ambiguities introduced by the acoustics of the concert hall itself would further impede an audience's ability to perceive the spatial effects through Boulez's use of multiple loudspeakers.⁶³ Even so, the development of software spatialization systems such as SPAT, and the advent of "surround sound" loudspeaker systems in cinematic exhibition have encouraged me to imagine that Boulez's composition attempted to realize a rendering in which shifting image and location are integral. Through unexpected encounters with magnitude and position in the concert hall, Boulez strove to create a musical experience so that we, the audience, might encounter a newly expressive type of performer.

same multi-channel system. I am indebted to Professor Sandroff for sharing his keen and hard-won insights into this piece.

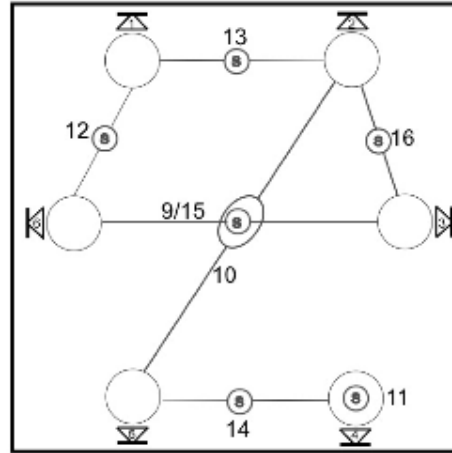
⁶³ I know from experience that *Dialogue* was occasionally performed in less-than-optimal situations. In 1988, I attended a performance of this composition by the Ensemble Intercontemporain (the resident performing ensemble of IRCAM under the direction of Pierre Boulez) in the Northwestern University gymnasium. The audience's ability to perceive any specific localization of the pre-recorded clarinet was impossible in the extremely reverberant space of the gym, especially when compared with another performance I attended by Sandroff and Yeh (see footnote 78) in The University of Chicago's Mandel Hall, the contrast was striking.

Pierre Boulez: Dialogue de l'ombre double (1985)
 an imagined effect of spatialization
 analysis by Matt Malsky

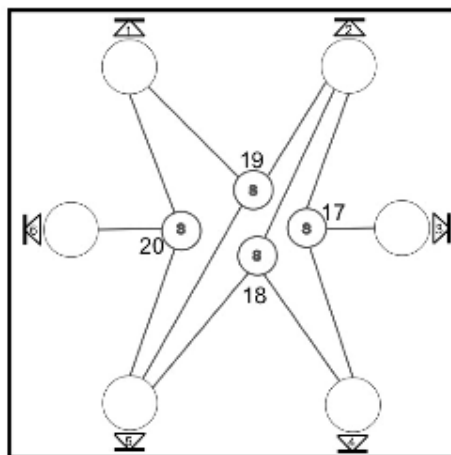
1. single speakers as sources



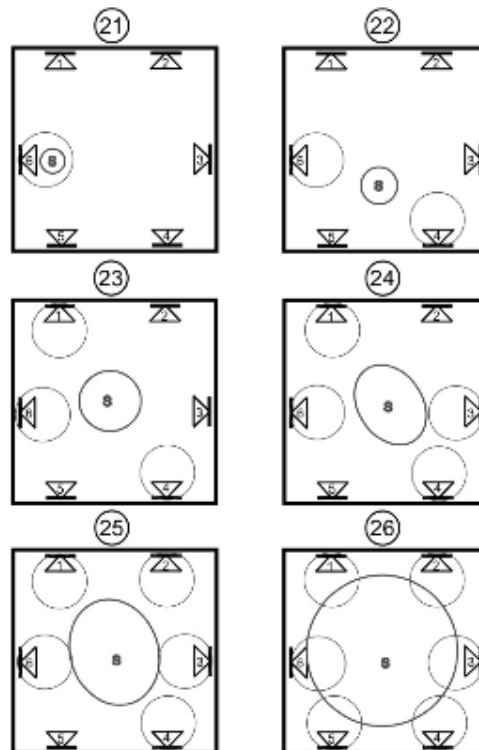
2. "stereophonic" pair as source



3. speaker "triplets" as source



4. progressive spatial enlargement



KEY:

⏏ loudspeaker

⊙ apparent sound source

1-26 phrase/cue number from score

Example 2

In recent electroacoustic compositions, new concert works in the tradition of *musique concrète*, the manipulation of the scale of sonic elements to achieve rendering has reached a sophisticated potential. In Paul Koonce's tape piece, *Walkabout* (1998), the timbre and scale of a variety of instrumental musical excerpts, along with other synthesized and acousmatic sounds, expand and contract via processing, creating "surplus space" and presenting a mobile, but impossible path of audition. Koonce describes this piece as one of a sequence with shared themes.

Walkabout continues this rich exploration of environment and music, with a work whose particular focus is on the juxtaposition and threading of musical styles... Into this arena of musical argument and delight is where *Walkabout* takes us as it elicits a host of particulars driven out by its chronic siren call reverberating in every tableau along the way. Like a mooring for memory's alchemical trip through all that does not belong, it both calls and warns of the epic escape, romantic even, which this circuitously wrought path promises. Or so it would seem to the ears of this composer who would imagine it, want it and all the serendipitous rejuvenation it promises, for this is the story of no one's path but my own through the escape of one's more sensible ways to other places.⁶⁴

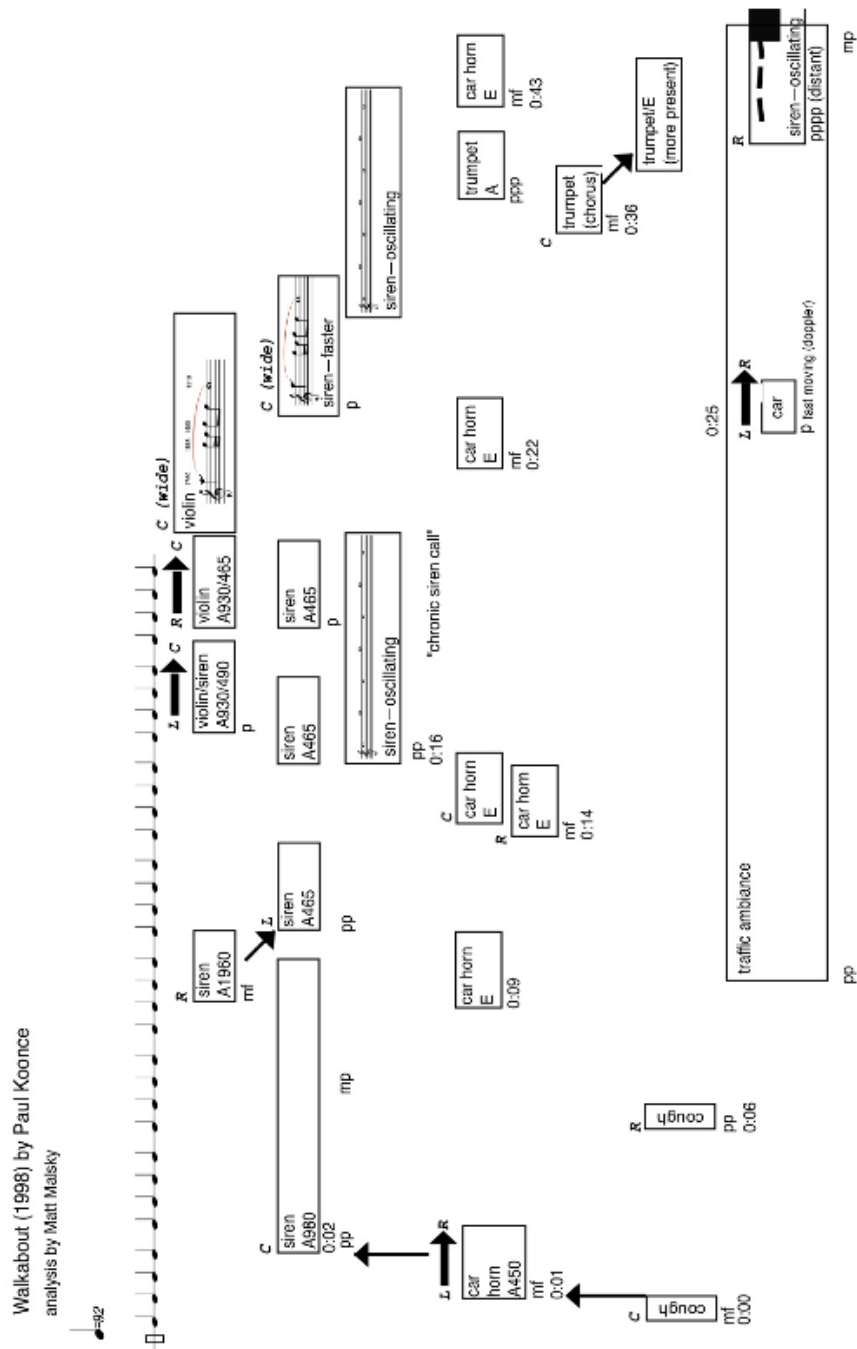
In *Walkabout*, we are pushed and pulled by the music itself from the familiar subject position of our comfortable concert hall seats to someplace where, as Koonce describes it, our experience of "conventional sounds and musical idioms can be re-enchanted through engagement with the extra-musical associations of the [composer's invented] environment and its places." Organized around the metaphor of aural tourism, the timbre and scale of sonic materials in *Walkabout* expands and contracts via processing and mixing. Quotidian sounds are coaxed into revealing their internal timbral and formal dimensions, and into participating in unexpected new musical stories.

This piece starts in a spatial vacuum (see Example 3). A cough, a car horn, and a siren (or is it a whistle or a violin?) innocently inhabit the same world of abstraction. They are all presented without any specific ambience, quite present and close to us but quiet and with an identifiable position within the stereo field. They all participate rhythmically in an irregularly articulated underlying pulse (0:00-0:20). Gradually, they are heard to conform to the pitches A or E. Though each sound's source is identifiable, in the absence of an over-arching narrative to bind these disparate sounds together, we increasingly focus on their constituent properties such as envelope (impulsive or sustained) and timbre (pitched or noisy): their spectro-morphological lives.⁶⁵ A formal collaboration of these elements is quickly revealed. Out of the din emerges the repeated "chronic siren call," an emergency vehicle-like oscillating signal (from A to E) that organizes this sound world (see Example 3, 16 seconds). Individual "sound objects" have already conformed to the siren's pitches (which oscillate between A and E) and the underlying pulse. The appearance of the siren's oscillations retrospectively organizes our understanding of the pitch and rhythmic characteristics of the cough, trumpet, and car horn. With a foot firmly in the world of *concrète*, these sound objects are the first of a

⁶⁴ Paul Koonce, "Walkabout," (Minneapolis: Sonic Circuits VI/innova, 1998).

⁶⁵ See Denis Smalley, "Spectro-Morphology and Structuring Processes," in *The Language of Electroacoustic Music*, ed. Simon Emmerson (London: The Macmillian Press Ltd., 1986), pp. 61-96.

multitude that will make appearances over the next 15 minutes (or so) of this composition, and participate in its thematically motivated structure.⁶⁶



Example 3

⁶⁶ See Simon Emmerson, "The Relation of Language to Materials," in *The Language of Electroacoustic Music*, ed. Simon Emmerson (London: The Macmillian Press Ltd., 1986), pp. 17–40.

But going on quietly beneath this formalist motivic development is a secondary operation, equally important to the music to come. Gradually, these sound objects will be coaxed into environmental associations and thus be "re-enchanted." Ten seconds into the opening and almost imperceptibly, a different type of sound object enters the fray: the ambient sound of traffic; the suggestion of an empty roadside (see Example 3, 10 seconds). Then at 25 seconds, a fast moving car zooms through from left to right with all its attendant presence, simultaneous with, but independent of, the coughs and car horns. Finally, about forty seconds into the piece, the oscillating siren itself moves into this contextualizing environmental "frame," grounding the abstract operations of the previously disembodied siren in a particular narrative situation. This becomes, perhaps, the most fascinating aspect of the composition. Rather than sandwiching rendered sounds between more conventional (i.e., reproductive) recording techniques, this composition integrates our requisite narrative perspective into the flow, using it as one of many different and shifting vantage points which the music offers its auditors from moment to moment.

Conclusions

But none of the spaces created by Koonce's composition are exactly synonymous with the actual space we, as its audience, occupy. With the composer as tour guide to the spaces of his/her aural imagination, the concert hall (or our own living rooms) becomes merely an antechamber to a machine that can transport us beyond not only the physical space of the concert hall, but into situations that can only exist through auditory fantasy. Speaking generally, the acoustic space we inhabit as an audience is becoming merely another pliable distribution channel—just as Adorno feared with radio. Its physical characteristics are mutable to the needs of the musical content and to the music's ideological mission. Even the most prestigious and sanctified temples to unadulterated human musical production, concert halls and opera houses, are more and more inclined to make their renovations electronically (and more than sometimes, in secret). A similar trajectory toward electronic control of space was rehearsed in the history of cinema exhibition. From silent movies as "live" musical performances with projection, the movie theater is now regularly treated as a blank slate, a *tabula rasa* upon which to create virtual visual and auditory environments to support the narrative.⁶⁷ Our recordings of music without a visual track (i.e., CDs), especially since the advent of surround sound, have adopted the logic of electronic reproduction. The necessary catalyst in all of these media is technology. All are only conceivable within the context of the digital world of recording and processing. It is the ever shifting battery of production techniques and methods of consumption that shape the boundaries of "reproductive" practices. Allied with mimesis, intelligibility, and a rational presentation of the world, reproduction is the signifying chain that binds us to audible reality.

Yet each of the examples discussed in this paper crosses a line in some way and exceeds contemporary standards of representation. Manipulations to the scale of materials, a pathological figure of production, and an encompassing frame of

⁶⁷ See Rick Altman, "The Silence of the Silents," *Musical Quarterly* 80, no. 4 (1996), pp. 648–718 and "The Sound of Sound: A Brief History of the Reproduction of Sound in Movie Theaters," *Cineaste* 21, no. 1/2 (1995), pp. 648–718.

reproductive practices are the means for stepping outside of convention. In these instances, we experience the concert hall in its failure to contain reality, as the "hole in the real" that sets symbolization in motion. The resulting technologized fantasy space is a stage for the projection of our desires for an unmediated musical expressiveness. Perhaps it is an abiding belief, or hope, that in our age of mass culture, overdetermined by reproduction, we can still, through music, experience that most fundamental and frightening of human connections: the real of another's experience. Even without explicit programs or narratives, the pieces discussed above question the social reality of the concert hall, and challenge the division of public and private experience. This is the cultural fantasy of concert music at its most potent and disconcerting.

Afterword (2012)

While revisiting this article, I've had the good fortune to spend some time in a venerable old concert hall. I recorded a pair of my chamber music compositions at Mechanics Hall in Worcester, MA. When it opened in 1857, Mechanics Hall was **the** tallest and largest structure in this increasingly industrial New England city. It was built by an influential trade guild, the Worcester County Mechanics Association, which needed a larger space for its classes and library.⁶⁸ The ornate building featured an Italian Renaissance Revival design and included a large hall for lectures, debates, and various entertainments. Lacking recourse to the as-yet-uninvented microphone or electronic amplifier, this hall was conceived and designed for audiences to effectively hear speakers' voices and music in a direct and unmediated way; however, that benefit is most often experienced differently now.

Today, while still the site of live events, this concert hall on the third floor is best and most enduringly known as an "acoustical masterpiece" and a favored recording venue. Mechanics Hall hosts labels such as Sony Classical, Nonesuch Records and Harmonia Mundi. Artists such as Midori and Yo-Yo Ma seek out its space and sound for their recording projects. In fact, as we were setting up for my session, the legendary Jack Renner, Telarc International's chief engineer and founder, was on the stage photographing for a scheduled AES presentation his preferred microphone placement for the hall's Hamburg Steinway D concert grand piano. We kibbitzed about the wonderfully warm and inviting sound of the room, and he reminisced about the contribution of the hall to "The Telarc Sound" which won forty Grammy Awards.⁶⁹ Integral to his tale was his role in designing the control room positioned two floors above at the back of the building, far away from the recording space. Seated next to my recording engineer all day in this space, I never actually heard my octet or wind quintet played live in the hall, only through the B&W Nautilus monitors. Connected to the Great Hall only via audio tie lines and a video feed, this control room, an acoustically neutral listening space, was my site of actual audition. The fabulous space where my musical sounds were being created was joined to my listening only through technological mediation and my imagination.

My recent experiences only re-confirmed for me that concerts are a residual cultural form; recorded sound is emergent.⁷⁰ The public concert for which Mechanics Hall was constructed in the nineteenth century no longer exist as reality, just as the role of the mechanics union has faded and their hall's principle function has morphed from site of live audition to recording facility. Nearly ten years ago I considered the sound of concert halls, the changed and changing relations between musical sound and space, and the function and effects of technological mediation. Rent asunder by recording, music and its meaning, I argued, must be considered through what I've called the cultural logic of electronic sound reproduction and the lens of psychoanalysis. More and more,

⁶⁸ From Mechanics Hall website, <<http://www.mechanicshall.org/>>, and informational brochures: Margaret A. Erskine, "Mechanics Hall" (Worcester, Mass.: Worcester Bicentennial Commission, 1977); and John Herron, "Mechanics Hall: Worcester County, Massachusetts National Register of Historic Places Nomination Form" (Washington, D.C.: U.S. Department of the Interior, National Park Service, 1972).

⁶⁹ <http://www.telarc.com/about/>, accessed April 2012.

⁷⁰ Williams, Raymond. "Base and Superstructure in Marxist Cultural Theory." *Problems in Materialism and Culture* (London: Verso, 1980) Reprinted as *Culture and Materialism*. London: Verso, 2005, pp. 31-49.

listening space is being made malleable, separated from production and subordinate to rendering technologies and delivery systems. Previously published in the cultural studies journal *Reconstructions*, this article, I hope, raised issues and presented a methodology, which are still important today especially to musicians. I'm pleased that it is now reprinted in *Search*.