Bytes and Backbeats

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Notes

INTRODUCTION

1. It is appropriate to put the notion of repurposed audio—which is defined and refined over the course of this work—in a broader context of related ideas. Serge Lacasse defines a related concept under the term transphonography, and in the process he surveys earlier works that employ the terms transtextuality, intertextuality, and others, all of which bear a relationship to the notion of repurposing presented here. See Serge Lacasse, “Towards a Model of Transphonography,” in Incestuous Pop: Intertextuality in Recorded Popular Music, ed. Serge Lacasse (Quebec: Nota Bene, forthcoming).


3. The term repurpose is hardly new, but I have adapted it here to apply to contemporary audio construction in specific, and I hope, original ways. In Jay David Bolter and Richard Grusin, Remediation: Understanding New Media (Cambridge: MIT Press, 1999), 49–50, the authors refer to repurposing as an element in their construction of the word remediation. Their notion that “Repurposing as remediation is both what is ‘unique to digital worlds’ and what denies the possibility of that uniqueness” mirrors the “made new” and “used again” dichotomy that I have introduced here.

4. I do not intend to idealize the listener’s position here. The listener’s judgment is only one marker of value in the cultural response to music, but it is the one that we each hold as our own.

5. The pun here is intentional and reinforces the notion that the manipulation of recordings is now frequently an essential part of musical play.


13. Ibid., 28.

14. Ibid., 222.


16. Bonnie Hayes’s song “Have A Heart” was written from a sound she happened onto, and the song was a hit for Bonnie Raitt. Ms. Hayes says she has written many songs inspired by synthesizer sound patches, and in casual conversations with other songwriters I have heard similar anecdotes.

17. Chanan, Musica Practica, 239.

18. One of the most well known was the denunciation by Matthew Stewart Prichard, assistant director at the Boston Museum, of plaster cast reproductions of sculpture.

The purpose of art, according to Prichard “is the pleasure derived from a contemplation of the perfect.” Casts were worse than merely imperfect, they were subversive; as “data mechanically produced,” casts were “the Pianola of the Arts” and no more belonged in an art museum than mechanical music belonged in a symphony hall. Casts were “engines of education and should not be shown near objects of inspirations.”


20. Ibid., 221.
21. Ibid.
22. Ibid., 224.
23. Ibid.
24. Ibid., 227. “Earlier much futile thought had been devoted to the question of whether photography is an art. The primary question—whether the very invention of photography had not transformed the entire nature of art—was not raised.”
25. Ibid., 224.
27. Chanan, Musica Practica, 6.
28. Ibid., 31.
31. Ibid., 21.
34. Ibid., 148.

CHAPTER ONE

1. The “talk-back” is the two-way communication system between those in the control room where the recording is being made and the artist who is performing in the studio.

2. A process whereby a bit of a recording was copied onto a second tape recorder and then painstakingly rerecorded back to the master tape recorder into the correct spot—thereby fixing a rhythmic anomaly or replacing some other problematic piece of audio with an acceptable equivalent.

3. The Eventide Harmonizer is a stand-alone digital device that alters pitch without altering time. This was a forerunner to the current technology that I will be describing for pitch fixing. It was primarily used to “thicken” vocals or instruments by adding slightly retuned and delayed “doubles” of an original performance. It could be used to fix pitch but only in certain fairly rare instances where the problem was a consistent degree of flat or sharp performance, and even then it was very difficult and time consuming to create an effective repair.

4. It is interesting to note that when I inquired at several of the professional studios in the Bay Area, they all said that the 24-track tape recorder was only being used to transfer older material into Pro Tools. Once transferred, these recordings may be remixed or repurposed in any number of ways. Analog tape recorders are rarely used for recording anymore, though they dominated professional recording for close to 30 years.

5. A plug-in is additional software that increases functionality in Pro Tools.
Some plug-ins, such as Beat Detective, come as part of the program, and others, such as Auto-Tune, must be purchased separately.

6. A region is a distinct piece of audio in Pro Tools. Any section of recorded audio in a Pro Tools file can be made into a region, and once it is, it can be edited independently—that is cut, copied, pasted, moved, processed, etc.

7. It should be noted here that it would also have been possible to build in a variety of different kinds of variations from strictly quantized note placement. Notes may be slightly rushed or lagged relative to the ideal beat, or randomly rushed and lagged within user definable parameters available within the “quantize” menu options.

8. Off-axis refers to sounds coming to a directional (cardioid) microphone from an area outside its intended pattern of pick-up.

9. For more detail on the capabilities of these plug-ins, you might reference the promotional material from a tuning plug-in called Tune that is a successor to Auto-Tune at http://www.waves.com/content.asp?id=1748. Accessed 4 January 2006.

10. This is a notion that I explore more thoroughly in chapter 6.


16. The contemporary relationship to musical encounters, in regard to technical performance, composition, and cultural encounters, will be taken up more thoroughly in chapters 7–9.

17. This speaks to learning modalities and other education considerations beyond the scope of the current work.


20. Frith, Performing Rites, 152.

21. Ibid.

22. Ibid.


26. This point of view is persuasively argued in Robert Philip’s Early Recordings. Not all researchers agree, however, and I return to a more thorough discussion of this topic in chapter 4.
28. There may be some debate about the significance of fluctuations that fall below the perceptual threshold. The problem comes in determining what is meant by perceptual. The ability to identify fluctuations (which itself fluctuates widely depending on the relative skill and sensitivity of the musical ear) does not necessarily coincide with the effect such fluctuations may have on the experience of music. I would argue that all fluctuations are perceived on some level and exert some degree of influence over the experience.
29. See Sterne, Eisenberg, Goodall, and many others on the earlier history of audio balancing techniques.
31. Cook, Music, Imagination and Culture, 188.
32. Ibid., 193.
34. Pacey, Meaning in Technology, 30.

CHAPTER TWO

1. I recorded a CD for Freddie in 2005 for Blues Express Records. The vocal tracks were recorded at Laughing Tiger studios in San Rafael, CA, but all of the editing was done at my home studio in San Francisco. Recording, editing, and mixing were all completed using Pro Tools software.
2. For a discussion of these basic audio-processing techniques, see most any introductory recording text such as my book The Art of Digital Audio Recording (New York: Oxford University Press, 2011).
4. Much has been written on this subject. For a discussion of the finalizing aspects of CD production see Bob Katz, Mastering Audio (Oxford: Focal Press, 2002), especially 128–32.
5. The following is from the developer’s promotion for this product at http://www.waves.com/content.asp?id=1748 (accessed 4 January 2006):

Breathing is something singers seem to insist on doing, even when it spoils a perfectly good take. Now DeBreath lets you not only eliminate those breaths, but also lets you turn them in your favor, using them for new creative effects.
DeBreath is a revolutionary new plug-in that automatically reduces or 
removes breath sounds on vocal tracks. DeBreath employs a unique tem-
plate-matching algorithm that detects breath segments and separates them 
from the main vocal, so breath sounds can be reduced or eliminated with-
out affecting the rest of the signal.

Because DeBreath can be used to separate a vocal track into two ele-
ments, one containing only voice and the other only breaths, each can be 
processed differently, for the emotional effects of breathing to be enhanced 
with additional processing if desired.

7. Ibid., 183.
8. Does it matter that in Dylan’s time it would not have been possible to 
“fix” those popped “p’s,” whereas the Billie Jo’s slurred “esses” are intentionally cre-
ated? What about “fixing” Dylan’s “p’s” now that it is possible? Is this akin to re-
moving surface noise and pops on old records for reissue? How about colorizing 
old black-and-white films? This opens a whole other discussion around intention-
ality, authenticity, and aesthetics too broad to be considered here.
10. Ibid.
11. Ibid.
12. Ibid., 181.
13. Ibid., 54.
15. Nicholas Cook, “Uncanny Moments: Juxtaposition and the Collage Prin-
ciple in Music,” in *Approaches to Meaning in Music*, ed. Byron Almén and Edward 
Pearsall (Bloomington: Indiana University Press, 2006), 133.
18. Ibid.
19. Ibid., 226. Frith is setting “pop” against “folk” and “art” as the three stages 
of music history “organized around a different technology of musical storage and 
retrieval” (226).
20. Ibid., 226–27.
22. Ibid., 180–81.
23. Ibid., 189.
26. Ibid.
27. Ibid., 188.
28. As this book is being written a new piece of software called Throat has 
been introduced that claims to provide the following powers of vocal processing. 
“Throat’s controls allow you to modify the voice’s glottal waveform as well as the
ability to globally stretch, shorten, widen, or constrict the modeled vocal tract. For more detailed control, the graphical Throat Shaping display lets you adjust the position and width of five points in the vocal tract model, from the vocal cords, through the throat, mouth, and out to the lips. Breathiness controls variable frequency noise in the model, resulting in a range of vocal effects from subtle breathiness, to raspiness, to a full whisper.” This is especially interesting in light of this discussion, adding more layers of possible interaction between recording techniques and Barthes’s idea of “grain.”

CHAPTER THREE

1. See also the ethnographic studies in Greene and Porcello, Wired for Sound.
2. Ibid., 274.
3. Ibid.
5. Ibid.
6. Alex Ross, private email communication, 11 July 2005.
8. Ibid., 60.
10. Ibid., 26.
13. Ibid., 106.
15. Warner, Pop Music, 35.
16. For a more complete description of this process see Sterne, The Audible Past, 219–21.
19. Ibid., 3.
20. Ibid., 46. Although it is not completely clear here whether Goodwin is referencing the original recording or the original performance, his prior assertions regarding the death of aura imply that he is still referring to the original in terms of the actual performance.
23. Ibid.
24. Ibid., 31.
26. Ibid.
34. Ibid.
39. Ibid.
43. Tyrangiel, “Auto-Tune.”
44. Ibid.
46. Freedom du Lac, “Motor Mouth.”

PART TWO

2. Ibid., 148.

CHAPTER FOUR

4. Ibid., 40.
7. A playlist is a new “track” in Pro Tools that occupies the same timeline as an earlier track—usually of the same instrument. Thus I had organized all the piano tracks on alternate playlists across the same timeline. When I would select a new piano playlist I would hear a different piano take, positioned in the same relative position to the overall arrangement as the other piano takes. My composite piano track was a playlist that also played along the same timeline.
8. *Head* is the term in jazz musicians use for the statement of the melody as opposed to the improvised elements. This is typically at the top, or head, of the arrangement. The reference here to “head out” is to the restatement of the melody at the end of the arrangement.
11. Ibid., 8.
13. Ibid.
15. Ibid., 5.
16. Ibid., 138.
17. Ibid., 291.
19. Ibid.
21. Ibid.
24. Ibid., 275.
26. Ibid.
27. This is not to deny the economic challenges for underserved populations that may be exacerbated by music’s increasing reliance on technology. This issue is covered more thoroughly in Part III.
28. Ibid., 260.

**CHAPTER FIVE**

1. The primary definition for the word *unintentional* according to dictionary.com is “not deliberate.” In this case it is the deliberate act of playing for the recorder—playing with the intention of creating a performance that will form a part of the final recording to be made public—that is not a part of Cray’s performance and thus unintentional.
4. With the cost of hard drives getting so low, the attendant cost of recording has become remarkably inexpensive. The previous professional analog standard allowed for seventeen minutes of 24-track recording on two-inch tape and cost approximately $200. The equivalent of 24-bit, 44.1 KHz, digital recording currently costs less than $10 in hard drive space.
5. At least the quality of the recording would be suitable. The subjective determination about the performance is, of course, a whole different issue.

6. Bonnie Hayes’s credits as a writer include songs for Bonnie Raitt, Bette Midler, Robert Cray, Booker T. and the MG’s, and Cher.

7. Pro Tools is the dominant computer-based music recording and editing program.

8. The Bonnie Hayes record that I’m referring to here is *Love in the Ruins* on Bondage Records. It is available through CD Baby, Amazon, and iTunes.


12. Ibid., 3.


CHAPTER SIX

1. This is certainly not a universal sentiment, and it has been increasingly undermined over the history of popular music. Certainly virtuosos have long enjoyed the status of artist, from Heifetz to Hendrix. Nonetheless, it is as composers and songwriters that the icons of popular music from Duke Ellington through the Beatles to Radiohead have achieved artistic standing. Many have argued for the elevation of improvisation to the stature of composition, and for the acceptance of musical interpretation on the same level as creation, but the fact that such arguments need to be made speaks to the undercurrent of cultural understanding that has created the separation of artist and artisan that I describe here.


3. Ibid.

4. Ibid., 496.


6. Ibid., 23.


8. Ibid., 39.


10. Many jazz critics have commented on the true nature of improvisation,


17. Ibid.

18. Ibid., 142.


23. Ibid.


27. Ibid., 102.


29. Ibid., 492.

30. Ibid., 241.


33. Crouch defines the high point in jazz improvisation as “that improvised occasion when the entire room—everything on the bandstand and off the bandstand—becomes one force defined by swing. . . . That, for those of you who don’t know, is the highest aspect of the performance relationship between the jazz musician and the jazz listener and the jazz place.” Crouch, *Considering Genius*, 286. See also Berliner, *Thinking in Jazz*, 497; and Johnson, “Jazz as Cultural Practice,” 96.


37. Covered extensively in Berliner, *Thinking in Jazz*, under a variety of headings including “Learning Discrete Patterns from Recordings” (101–5) and “Inferring Soloists’ Models” (237–42).
42. Butterfield, “Jazz Analysis,” 287.
44. Ibid.
45. Ibid., 104.
48. Ibid., 152.
49. Sawyer, “Improvisation and the Creative Process,” mistakenly identifies this movie as having been made by Claude Renoir.
55. Ibid.
58. This is not to say that improvisations, when transcribed, are equivalent to compositions created originally through notation. Scores made from improvised performances appear to embody a complexity even beyond that of the greatest classical compositions, but the problem in suggesting an equivalency lies in that any such transcription is an abstraction that doesn’t take into account the social and musical process. Although it appears to be as concrete as a traditional composition, the improvisation never actually existed as an abstract structure. See Nicholas Cook, “Analyzing Performance, and Performing Analysis,” in *Rethinking Music*, ed. Nicholas Cook and Mark Everist (Oxford: Oxford University Press, 1999), 260–61.

60. For more on how contemporary composers are stretching the bounds of spontaneity see Justin Davidson, “Measure for Measure: What Conductors Convey to Musicians,” New Yorker, 21 August 2006, 60–69.


63. This summarizes some of the excellent description and formulation of these issues in Pope, “Good Electroacoustic Music.” There is a tremendous amount of activity in this area—most of it well beyond the scope of this research. A good starting point for those interested would be Todd Winkler, Composing Interactive Music (Cambridge: MIT Press, 1998).

64. This brief description of “new complexity” was gleaned from a Humanities and Arts Research Center (HARC) Research Training Seminar on Issues in Contemporary Notation delivered by Keith Potter on 2 November 2005. I believe this very cursory discussion is interesting in the context of the larger issues considered here, but it hardly scratches the surface of these musical pursuits, which are well beyond the scope of this research.


66. Ibid.

CHAPTER SEVEN

1. The simple explanation for this capability is that, because of the nature of digital audio (using computer language to describe audio through a series of bits and bytes), musical samples can be shortened by eliminating some bytes, or stretched by adding bytes. By using algorithms to make “intelligent” decisions about which bytes to eliminate or add, the resulting music sample may be faster or slower without any shift of pitch and without noticeable audio artifacts.

2. The African bell pattern sets up a fundamental sense of hemiola. It can be described in various ways using notation, but the simplest is to create a phrase in 3/4 time that consists of two quarter-notes, an eighth-note, three more quarter-notes, and a final eighth-note. The same rhythm in 4/4 time would be constructed using eighth-note triplets with the same values (e.g., the first triplet figure would contain one quarter-note and then one eighth-note tied to the first eighth-note of the second triplet in order to create two quarter-note triplets, etc.). The version in 3/4 emphasizes the “three” pulse, while the 4/4 version emphasizes the “four” pulse.


11. Ibid.
14. I have explored this notion in a different musical setting and for a different analytical purpose in chapter 2.
19. Ibid.
20. Ibid.
30. That this occurred within the context of American slavery cannot be ignored.
33. Ibid., 132.
34. This level of fundamental polyrhythmic and contrapuntal expression is found in various schools of jazz and modern classical music, but it is not in widespread use in European or American musical expression.

39. Ibid., 11.


41. Attali, *Noise*, 120.

42. Ibid.

43. Ibid., 122.

44. This is a distillation and expansion of ideas found in Cook, *Music, Imagination and Culture*, and Cook, *Music: A Very Short Introduction*, and includes some elements that Cook credits to Joanna Hodge.


49. Ibid., 288.


52. Ibid., 229.

53. Ibid.

54. Ibid., 271.

55. A recent example is the recording of Frank Sinatra’s *Duets* CD, where most of his collaborators performed their part of the duet in real time from remote locations—discussed more thoroughly here in chapter 4.

56. A recent example is the offering of all the original multitrack recordings for two complete songs from the record *My Life in the Bush of Ghosts* by David Byrne and Brian Eno. For details see http://bushofghosts.wmg.com/home.php. Accessed 25 June 2006.


58. Ibid.


63. See Frith’s conclusions after an evening spent with old friends listening and dancing to music. Ibid., 278.

64. Lysloff and Gay, introduction to *Music and Technoculture*, 10–11.

65. To be thorough one must add the human beatbox (drumming performed by slapping various body parts) as another nontechnologically mediated form of music expression.
CHAPTER EIGHT

3. Attali, Noise, 106.
5. Frith, Performing Rites, 229.
6. Ross, “The Recording Effect.” For the work around which much of this discussion often revolves see Philip, Early Recordings.
7. Tia DeNora, Paul Gilroy, Simon Frith, Nicholas Cook, Jonathan Sterne, and others have written extensively on balancing the complex relationships involved.
8. A lot more could be said about the use of the word currency, but the economic dynamic that is implicit here is beyond the scope of this research.
10. I don’t have statistical data on this, but it does seem this way to me in my contact with many musicians. They may not be fully trained recording engineers (though a surprising number are), but almost all of them do some amount of recording on their own.
12. At the 1990 Grammy awards the group Milli Vanilli won the Grammy for best new artist. The Grammy was subsequently stripped from the group when it was learned that they did not actually perform the music on the winning recording.
14. Although firmly established in myriad ways today, amazingly, Feuerbach first floated this idea in 1843 (Sontag, On Photography, 153).
17. For more on this see “Recording Redefines Improvisation” in chapter 6.
18. Explored broadly in chapter 1.
21. The word musicking is taken from Christopher Small’s work and is now a widely used word indicating an active participation in the making of music. See Small, Music of the Common Tongue and other of his writings.
23. Ibid.
24. Ibid., 5, 6.
25. Ibid., 204.
26. Ibid., 140.
27. Ibid., 205.
29. Ibid., 10.
31. Ibid.
32. Nicholas Cook, personal communication.
33. It should be reiterated here that by musical recordings I include construction of music from previously recorded (repurposed) audio, along with more traditional “recordings” that involve newly recorded audio.
35. These earlier manifestations are explored in Serge Lacasse and A. Bennett, “Phonographic Anthologies: Mix Tapes, Memory, and Nostalgia,” in Lacasse, *Incestuous Pop*.
36. This borrows from Alex Ross’s (2004) ruminations on the iPod in his *New Yorker* piece about a classical music kid that loves pop. The full reference is used in the final chapter of this book.
38. I imagine many on the classical side are still not aware of how “artificially” constructed that music may be, primarily through editing of pieces from multiple performances in order to create the final version.
40. For reciprocity along the composer/performer/consumer continuum see especially Sterne, *The Audible Past*, 215–86.
42. Because GarageBand is only available for Apple/Mac computers, the depth of its penetration is somewhat limited. However, there are several free recording programs available for the PC such as Audacity and Kristal Audio Engine. These do not have as extensive a feature set as GarageBand but point the way to broader access to these music construction capabilities for all computer owners.
44. Ibid., 147.
47. Ibid.
56. Ibid.
57. Ibid.
66. Ibid.
68. Ivey and Tepper, “Cultural Renaissance or Cultural Divide?” B6.
69. Ibid.
70. Ibid.
72. Ibid.
73. Ibid., 9–10.
74. Ibid., 3.

**CHAPTER NINE**

3. Ibid.
4. Ibid., 147.
7. Ibid.
9. Ibid., 158.
17. Ibid., 6.
20. Ibid., 36.
24. Ibid., 140.
26. Ibid.
29. Ibid.
30. Ibid.
31. Ibid., 323.
33. Ibid., 150.
34. Ibid., 162–63.
39. Ibid., 101.
40. Ibid., 122.
42. Ibid., 140.
43. Ibid., 141.
46. Ibid., 157.
48. While I am steering clear of analysis of specific examples of popular music that have been tainted with accusations of inappropriate cultural appropriation, I would feel remiss without at least mentioning two of the most prominent examples. Paul Simon’s *Graceland* was widely vilified for supposedly improper appropriation of the musical culture of South Africa, while Moby’s *Play* was criticized for its supposedly inadequate attributions to the musicians from the Alan Lomax recordings that it used as samples. Both records were enormously popular and considered creative successes by many critics. Both records stirred interest and attention for the music they referenced. Were both records less than perfect in their attribution of credit? Probably. Is the music world a better place for their appearance? One has to make their own judgment, but I would argue that these recordings, despite their flaws, stand as tributes to many of the positive elements of cultural cross-fertilization.
50. Ibid., 127.
51. Ibid.
53. Ibid., 102–3.
54. Ibid., 102.
55. Ibid., 104.
56. Ibid.
57. Ibid.
58. Ibid.
59. Ibid.
60. Ibid., 105.
62. Ibid.
64. Ibid., 67.
68. Cook, Music, Imagination and Culture, 6.
69. Ibid., 7.
71. Although I was a professional musician, I have not worked as one in many years. I have never composed professionally—my skills are certainly light years away from the likes of Bartók!
72. Bartók may well have had other motivations for borrowing from the Hungarian tradition revolving around both his musical and personal identity. In neither case are these necessary elements in the appreciation of his music.
74. Frith, Performing Rites, 242.
75. Baudrillard, Simulacra and Simulation, 78.
76. Ibid. 77.

CONCLUSIONS

1. Chernoff points to this parallel in direct connection to his study of African music, but I think it warrants a broader interpretation. See Chernoff, African Rhythm, 21–23.