IRISH RESEARCH COUNCIL
An Chomhairle um Thaighde in Éirinn

This research is supported by the IRC Government of Ireland Postdoctoral Fellowship programme.

Subverting algorithmic policies of sonic control in Nicolas Collins's *Broken Light* (1992)

Dr Eamonn Bell
Department of Music
School of Creative Arts
Trinity College Dublin

Presented at
American Musicological Society
Annual Meeting
November 2020

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TRANSCRIPT
Available as supplementary material
FULL PAPER w/SLIDES and BIBLIOGRAPHY
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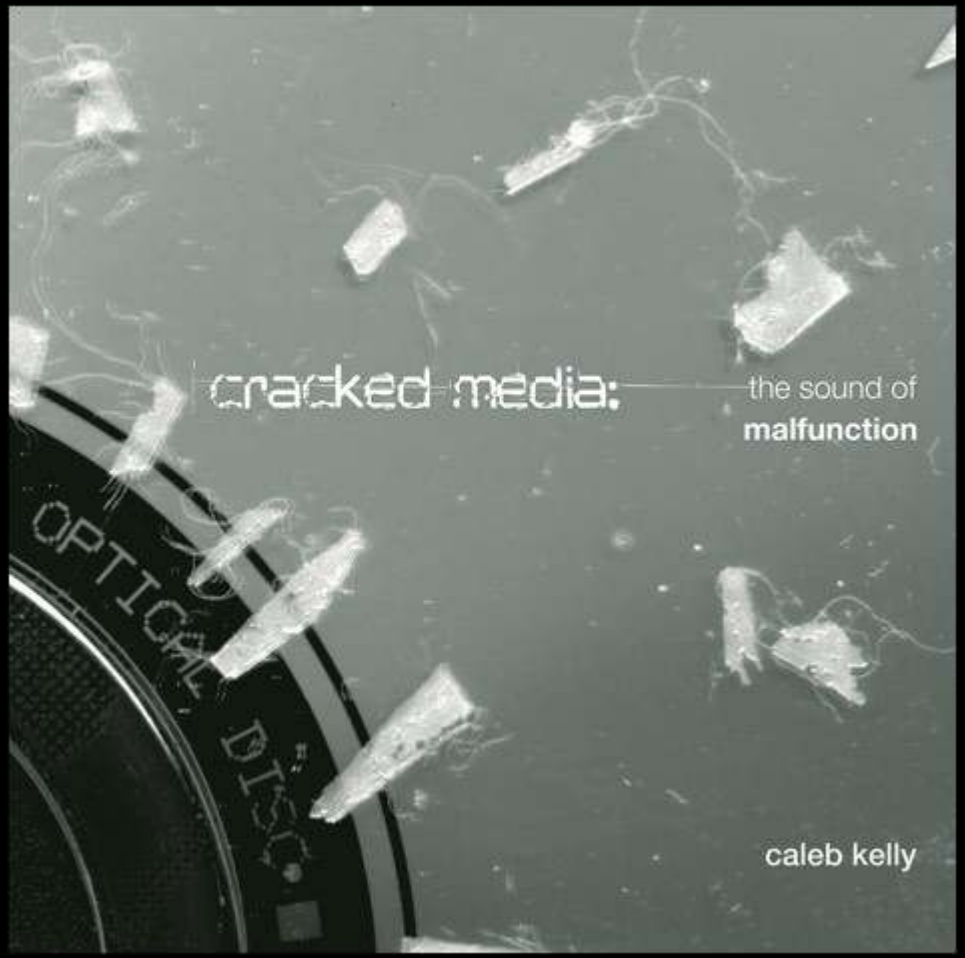
1. Introduction

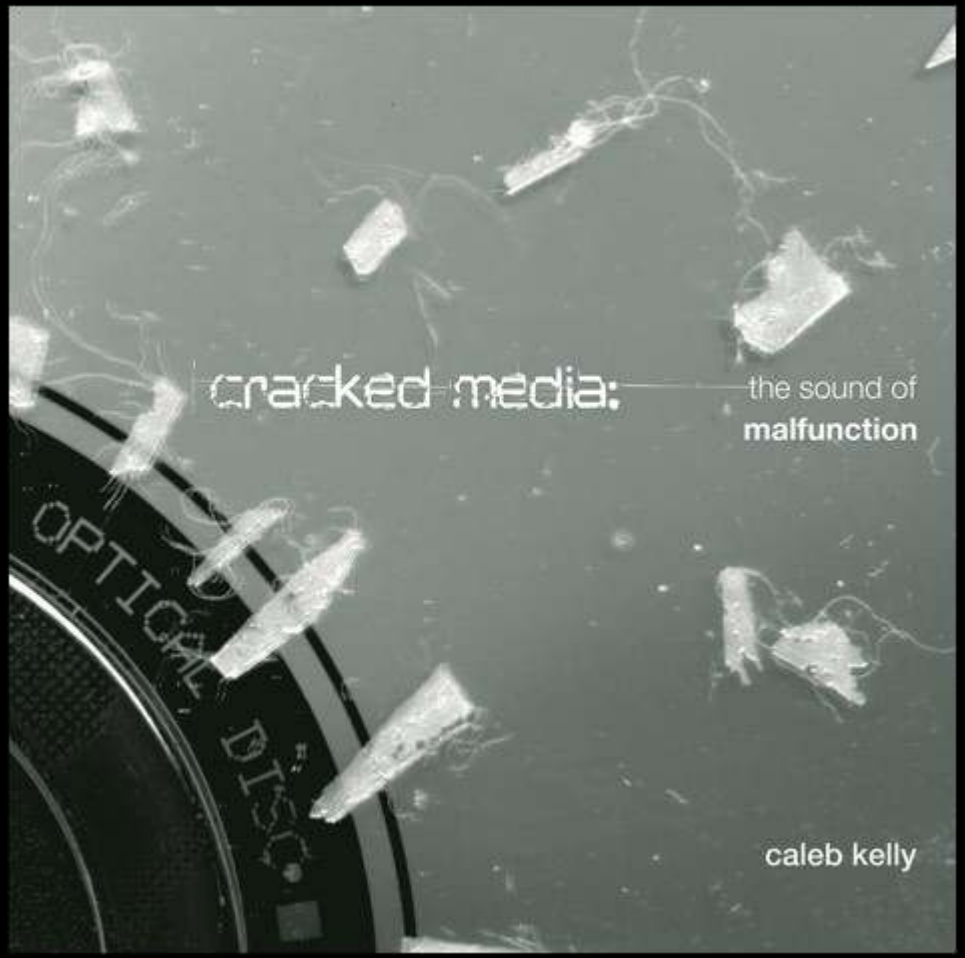
2. On *Broken Light*

3. On algorithmic policies of sonic control

4. Conclusion



(Kelly 2009)



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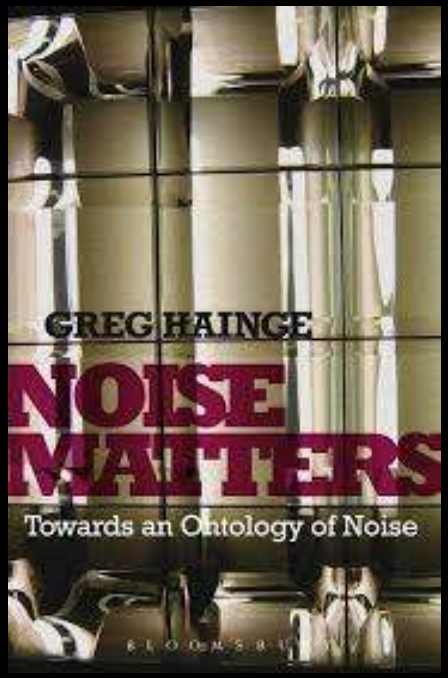

(Hainge 2013)

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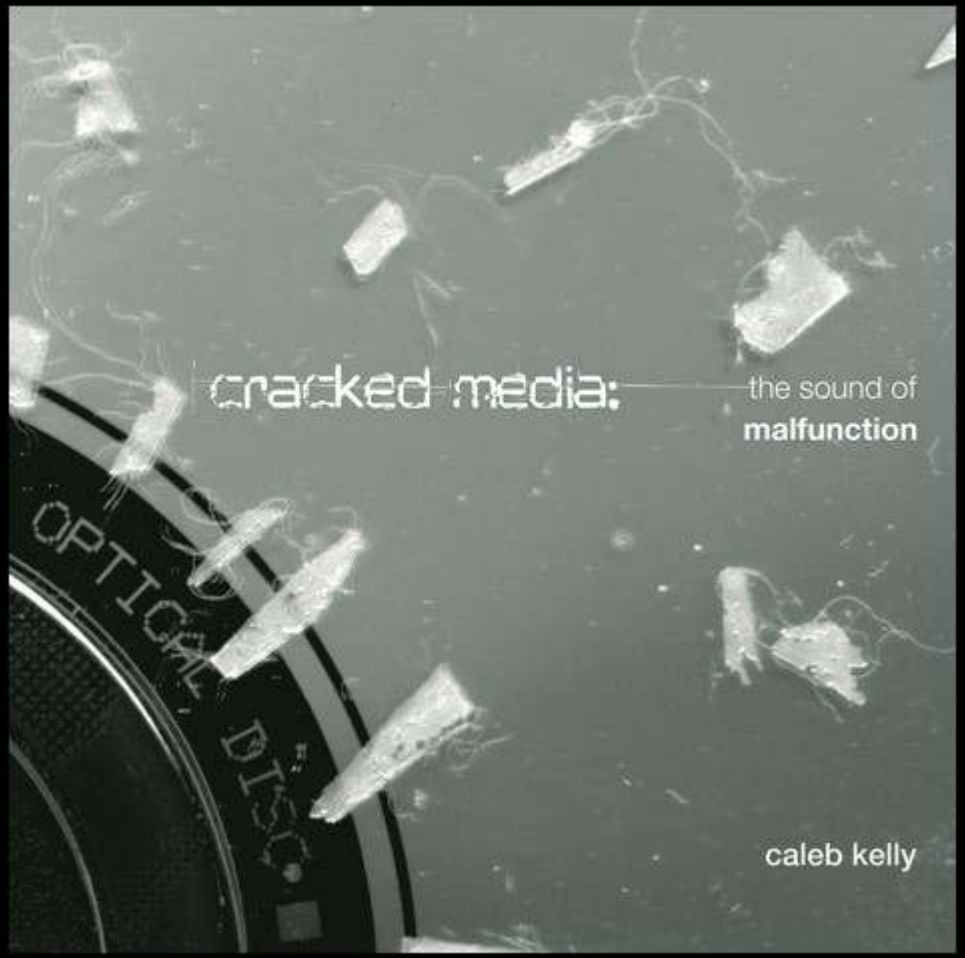

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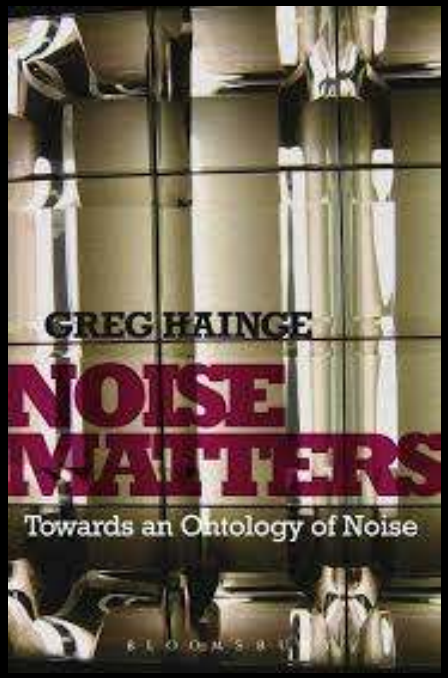

(Hainge 2013)

(Thompson 2017)

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Recent STS accounts of circuit-based electronic music/“hacking”

(Teboul 2018; 2020)

(Nakai 2014; forthcoming)

Media archaeology

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Kittler “middle period” (*per* Winthrop-Young 2017)

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The Plan

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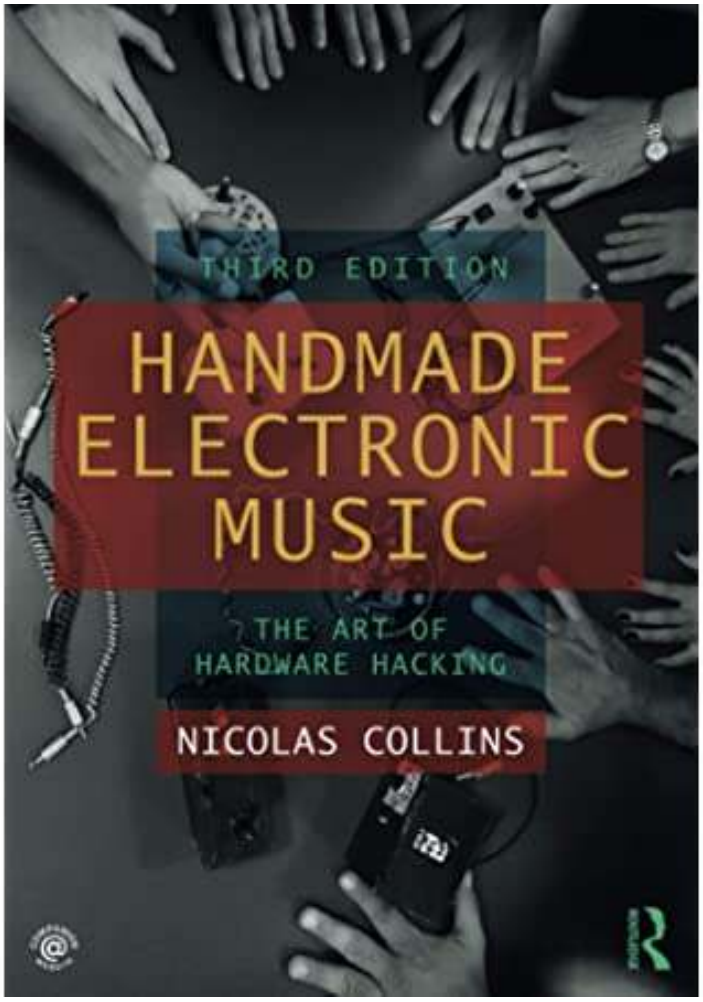
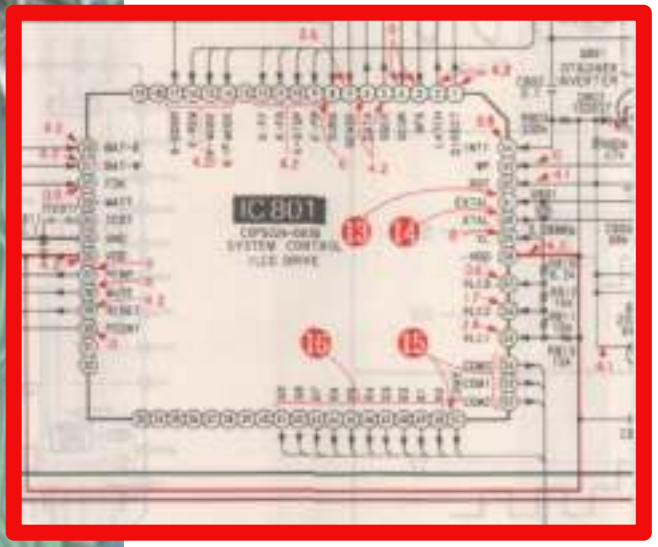
Nicolas Collins (b. 1954).
Photo credit: Marty Perez



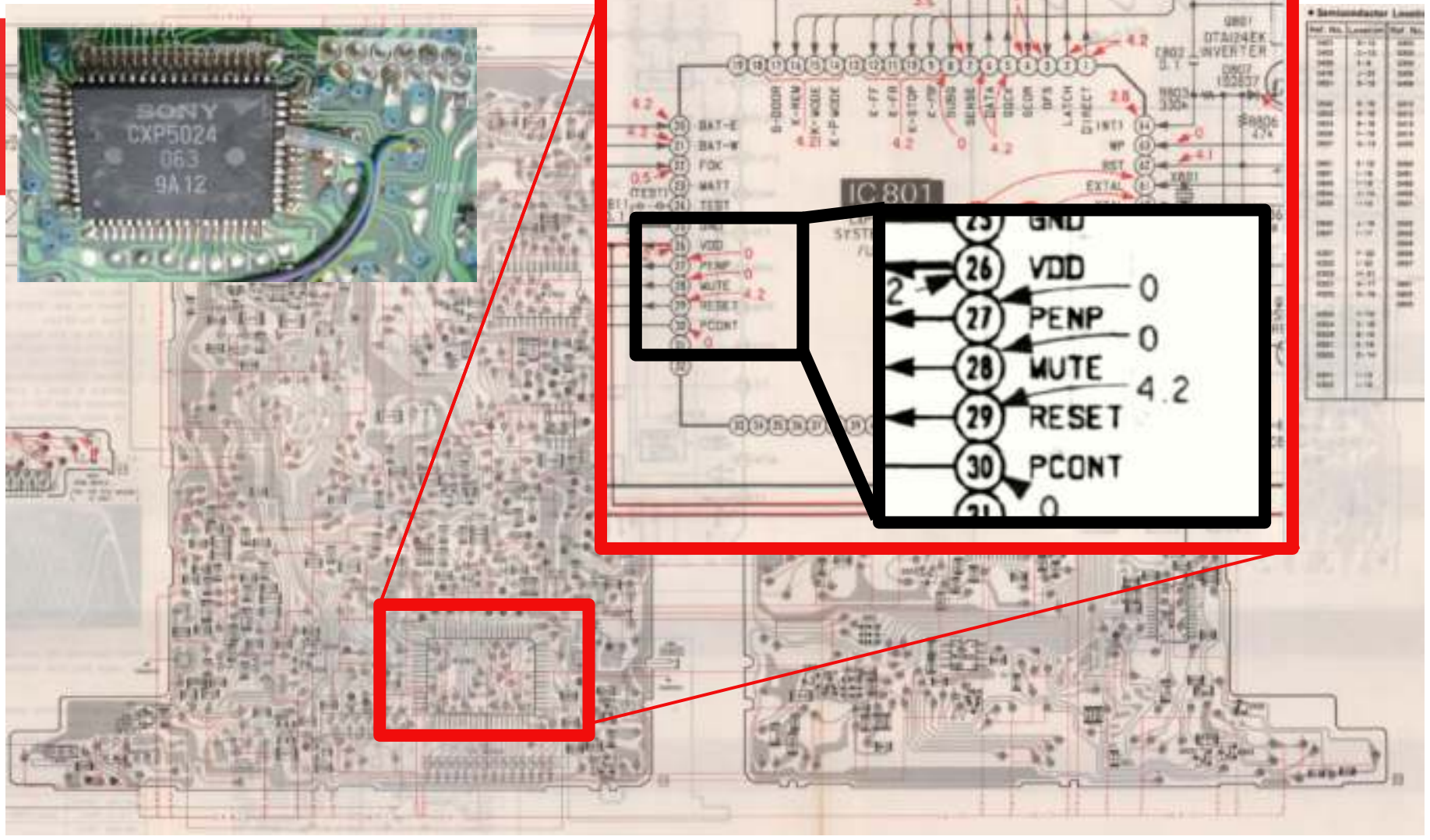
3° edition (2020)

I Musici, Christmas Concertos: Corelli, Manfredini, Torelli, Locatelli. Recorded 1984. Philips 412 739-2, 1990. CD.

Soldier Quartet. 1983 Lineup.



Lifted “mute” pin on chip in Sony D2 Discman (wires go to switch for mute enable/disable.) (Collins 2009)



Sony Corporation. Service Manual for Discman D-2 (launched c. 1988)

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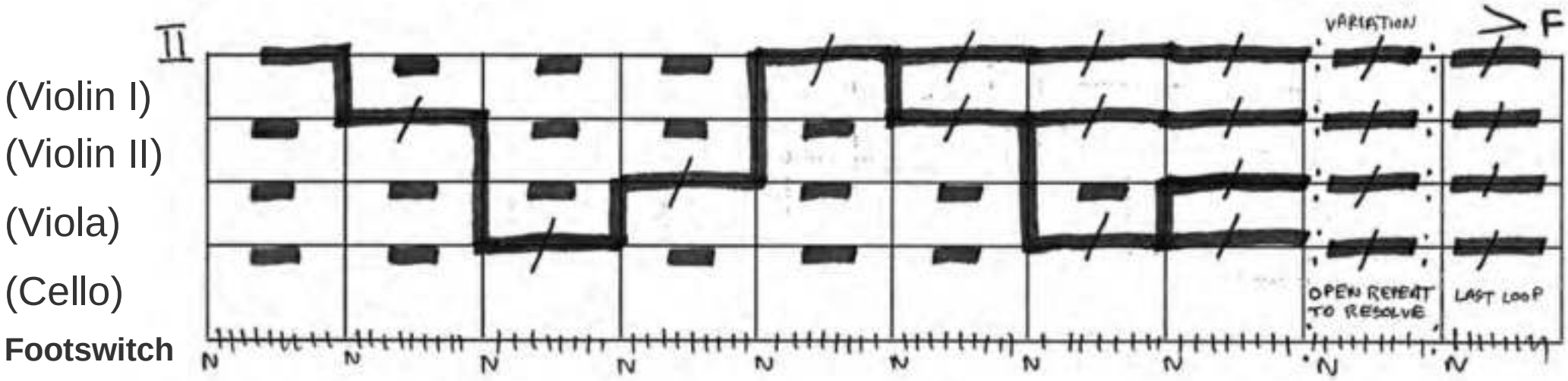
Set-up for *Broken Light,* showing hacked Sony D2 Discman; modified Sony remote control (in blue box); breakout box for connecting footswitches to remote control; footswitches to call up tracks for three movements (“1”, “2”, “3”), scratch across CD (“S"), and nudge through tracks ("N"). (Collins 2009)

Under the control of the performers, the CD player “scratches” across the disk, isolating and freezing short loops of recorded music. As it slowly steps from one “skipping groove” to the next, the lush contrapuntal texture of the *concerto grosso* is suspended in harmonic blocks, with the insistent rhythmic feel of the loop superimposed. The performers’ parts, both written and improvised, mesh and clash with the CD, with a respectful nod to Terry Riley’s *In C*.

(Collins 2009)



Detail from score for Nicolas Collins, *Broken Light* (1991, rev. 1992)

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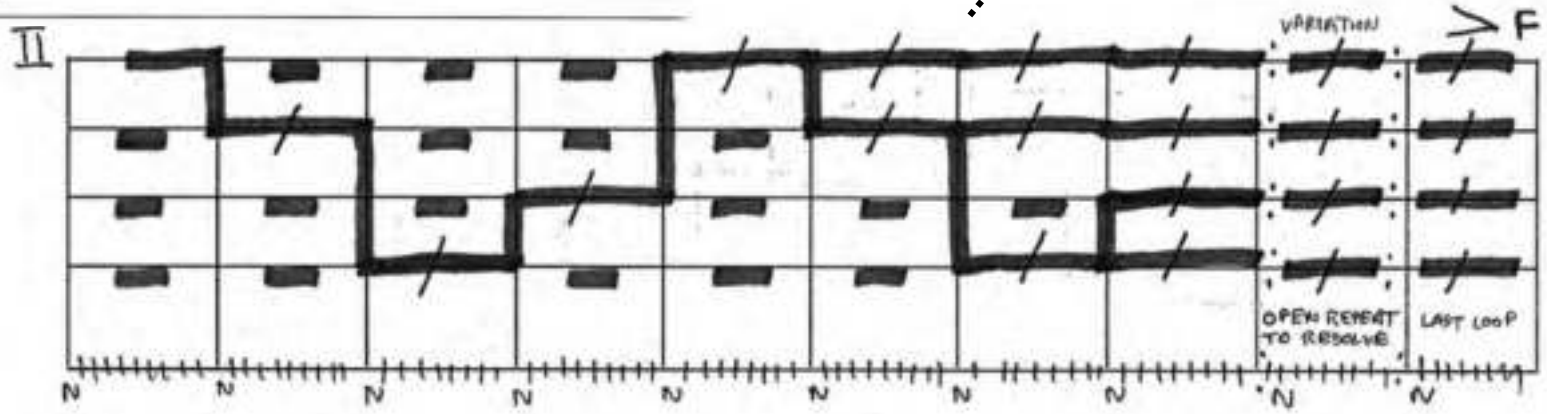
SECTION 2 VARIATIONS

Number of players active in each CD harmony loop (take rests)
Number of changes: 1 resolution
repeat/alternate old & new pitch
sequence of more than 1 pitch after resolution
Single or double stop
Stop or gliss harmony resolution

c. 1:00 [Excerpt ends]



Section 2: c.4 minutes
Slow movement. Sustained bowing with passing dissonances resolved. Begin with Violin 1 taking pitch from harmony, passed on to Violin 2 at loop harmony change; Violin 2 changes to new pitch for new harmony mid-way through "bar," then passes this new note on to Cello at next harmony change, then viola. Octave change permitted on any pass. Then repeat sequence but add up instruments rather than replacing 1 for 1; each new player can select any previous player's pitch on entry. Once full quartet is in, continue form of sustained bowing, carrying pitch over loop harmony change and then "resolving." Variations as indicated on score. Listen carefully for resolution to F at end; fade out on last breathy CD loop.

The Soldier Quartet
Nicolas Collins
Broken Light, II. “Locatelli” (3:45)
It Was a Dark and Stormy Night
Trace Elements Records, 1997

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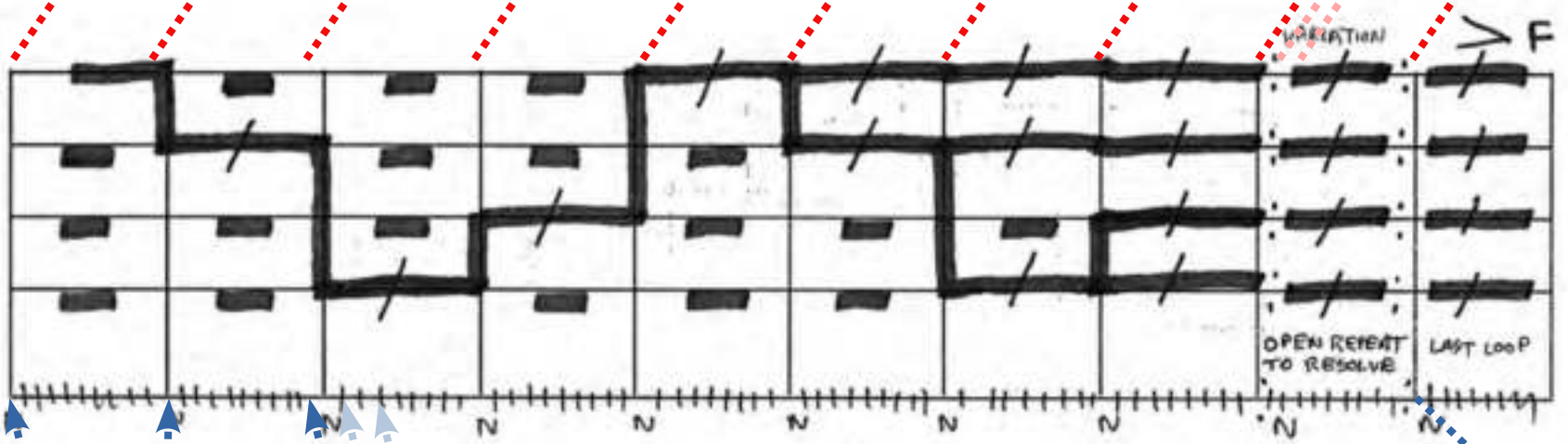
Footswitch press (“**N**udge”) [time in recording of *Broken Light*]

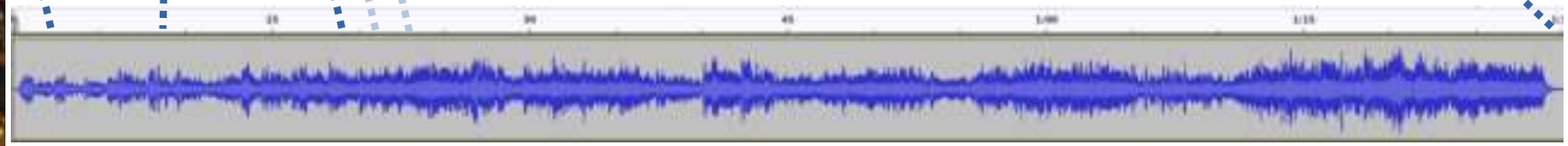
Loop source [time in recording of Locatelli, Op. 1/8, II mvt.]

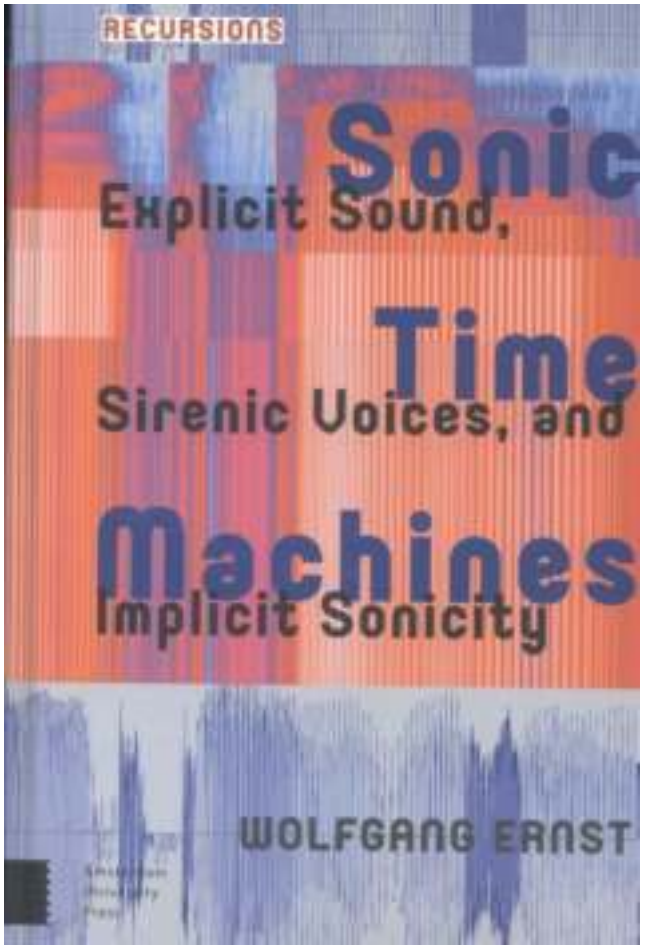
0:00 0:14 0:25 0:35 0:47 0:56 1:06 1:18 1:30 **3:21**

x9



0:04 0:08 **?** **1:27**




RECURSIONS
Sonic
Explicit Sound,
Time
Sirenic Voices, and
Machines
Implicit Sonicity
WOLFGANG ERNST

(Ernst 2016)

Collins’s other work with CDs

- *In CD* (1992) [for Impossible Music ensemble]
- ***Still Lives* (1992)**
  - *Still (After) Lives* (1997)
- *Shotgun* (1995)
- ***Die Schatten* (1996)**
- *microstoria_snd processed* (1997)
- *Broken Choir* (1997)
- ***English Music* (2002)**

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Sony CDP-101 interface

Philips CD 104 interface

Image credit: British Library

"CDs featured certain conveniences that transcended the other available modes."

(Plasketes 1992, 112)

Sony CDP-101 interface

Philips CD 104 interface

Image credit: British Library

"CDs featured certain conveniences that transcended the other available modes."

(Plasketes 1992, 112)

"[Y]ou didn't have to bother with delicately moving a phonograph arm or engaging in a frustrating rewind-stop-play-stop-rewind tango with your tape player.

(Mnookin 2007 quoted in Daniel 2019, 161)

The CD “Tweak”-osystem

Detail from ad for Monster Cable’s CD SoundRing™ in *High Fidelity* Feb. 1989

Detail from Denby, “Twin Tweaks” in *New York Magazine.* July 16, 1990.

(Perlman 2003; Downes 2010)

"...even lets you select tracks without budging from your armchair..."

Sony ad copy for the US market c. 1983.

See, for example *HiFi and Stereo Review*, September 1983

Sony prototype digital audio compact disc player “Goronta” *c*. 1981.

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Sony prototype digital audio compact disc player “Goronta” *c*. 1981.

Sony CDP-101. Released 1982.

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Philips TDA1541A [DAC]

Philips/Signetics SAA7000 [concealment]

Sony Discman D-20
Main PCB

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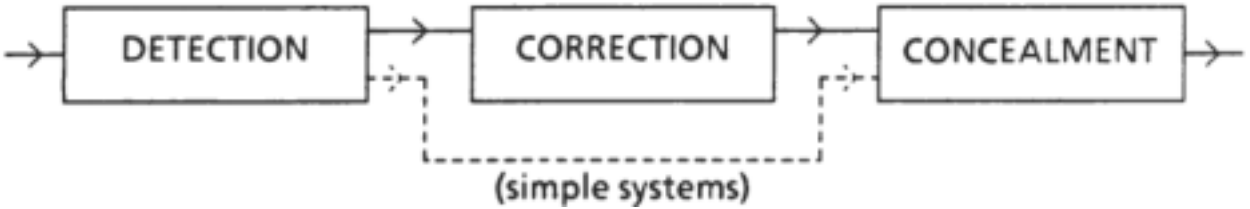
Policies of sonic control

- regulate what and when the data that the medium inscribes is understood as sound and what and when it is understood otherwise

Algorithmic policies of sonic control

- regulate what and when the data that the medium inscribes is understood as sound and what and when it is understood otherwise
  - more or less autonomously
  - in hardware and software
  - generally, but not always, without the oversight or control of their users (Kittler 2012 [“Protected Mode”])
  - not user-modifiable without significant deviation/“de-scription” (Akrich 1992)

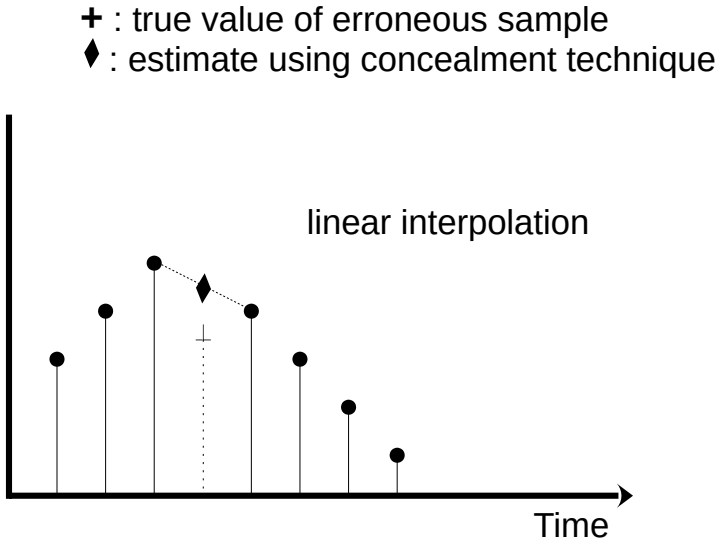
Correct, *then* conceal



(Sleight and Tutton 1990, 4.3)

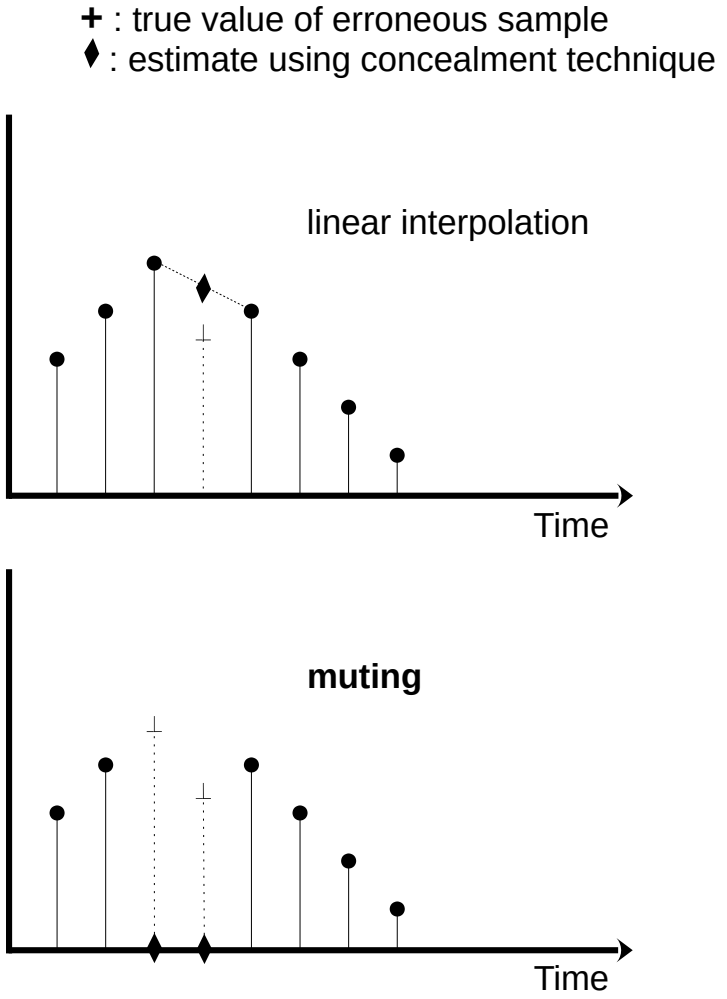
Error concealment

- Used when CD error-correction (CIRC) fails
- Two main strategies
  - interpolate (guess)



Error concealment

- Used when CD error-correction (CIRC) fails
- Two main strategies
  - interpolate (guess)
  - **mute** (to digital silence)



Muting (for error concealment)

- Pre-CD research into tape dropout showed listeners tolerated 10ms muting in musical context (Cardozo and Domburg 1968)
  - Research conducted out at Philips/TUE/[NL] joint venture
- Carried forward to “Audio Long Play” and descendant CD project (Peek 2010)
- “perceptual technics” (Sterne 2012)

Muting — summary

- Part of the day-to-day operation of CDs
- As shown by *Broken Light*, **to facilitate track cueing**
- ...but also **to conceal the effects of damage and defect**
  - More often than manufacturers estimated they would (Ranada 1982, 70)

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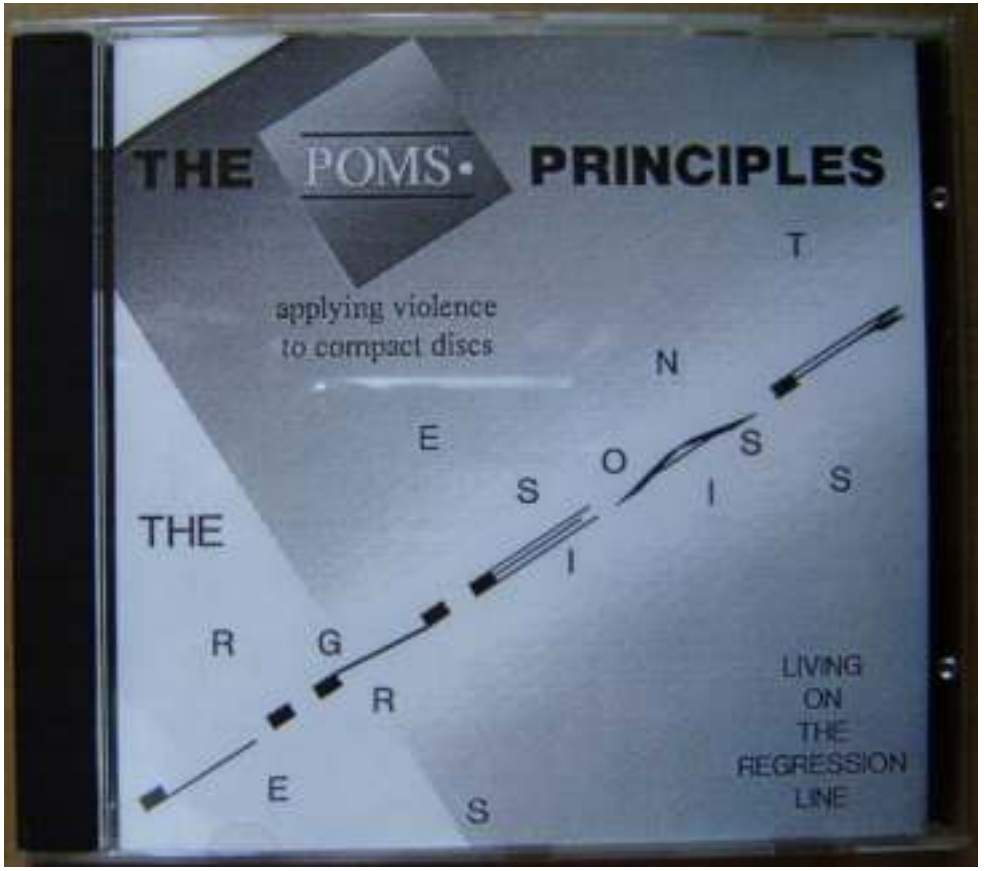
Various Artists, The Digital Domain: A Demonstration. Elektra 9 60303-2, 1984. CD.

(Kromhout 2014; Anderson 2015)



The Linear Regressionists, Living on the Regression Line. Pursuit Of Market Share/RRRecords POMS ROI-001/CD-002. Germany, 1990. CD.

(Mowitt 1987; Downes 2010)

Works cited (I)

Akrich, Madeline. "The De-Scription of Technical Objects." In *Shaping Technology/Building Society*, edited by W. Bijker and John Law, 205–224. Cambridge, MA: MIT Press, 1992.

Anderson, Tim J. "Training the Listener: Stereo Demonstration Discs in an Emerging Consumer Market." In *Living Stereo: Histories and Cultures of Multichannel Sound*, edited by Paul Théberge, Kyle Devine, and Tom Everrett, 107–24. New York: Bloomsbury Academic, 2015.

Collins, Nicolas. "Hacking the CD Player," September 2009. https://www.nicolascollins.com/texts/cdhacking.pdf.

Daniel, Ryan. "Digital Disruption in the Music Industry: The Case of the Compact Disc." *Creative Industries Journal* 12, no. 2 (May 2019): 159–66. https://doi.org/10.1080/17510694.2019.1570775.

Downes, Kieran. "'Perfect Sound Forever': Innovation, Aesthetics, and the Re-Making of Compact Disc Playback." *Technology and Culture* 51, no. 2 (2010): 305–31.

Ernst, Wolfgang. *Digital Memory and the Archive*. Edited by Jussi Parikka. Minneapolis, MN: University of Minnesota Press, 2013.

———. *Sonic Time Machines: Explicit Sound, Sirenic Voices, and Implicit Sonicity*. Amsterdam: Amsterdam University Press B. V., 2016.

Kittler, Friedrich A. "Protected Mode." In *Literature, Media, Information Systems: Essays*, edited by John Johnston. Critical Voices in Art, Theory and Culture. London/New York: Routledge, 2012.

Kromhout, Melle. "An Exceptional Purity of Sound: Noise Reduction Technology and the Inevitable Noise of Sound Recording." *Journal of Sonic Studies* 7 (June 2014).

Works cited (II)

Mowitt, J. "The Sound of Music in the Era of Its Electronic Reproducibility." In *Music and Society: The Politics of Composition, Performance, and Reception*, edited by Richard D. Leppert and Susan McClary. Cambridge; New York: Cambridge University Press, 1987.

Nakai, You. "Hear After: Matters of Life and Death in David Tudor's Electronic Music." *Communication + 1* 3, no. 1 (September 2014). https://doi.org/10.7275/R5GT5K3F.

Peek, Hans B. "The Emergence of the Compact Disc." *IEEE Communications Magazine* 48, no. 1 (2010).

Perlman, Marc. "Consuming Audio: An Introduction to Tweak Theory." *Tijdschrift Voor Mediageschiedenis* 6, no. 2 (2003): 117–28.

Plasketes, George. "Romancing the Record: The Vinyl De-Evolution and Subcultural Evolution." *The Journal of Popular Culture* 26, no. 1 (1992): 109–22. https://doi.org/10.1111/j.0022-3840.1992.00109.x.

Ranada, David. "Digital Debut: First Impressions of the Compact Disc System." *Stereo Review*, December 1982.

Sterne, Jonathan. *MP3: The Meaning of a Format*. Sign, Storage, Transmission. Durham, NC: Duke University Press, 2012.

Teboul, Ezra. "Electronic Music Hardware and Open Design Methodologies for Post-Optimal Objects." In *Making Things and Drawing Boundaries: Experiments in the Digital Humanities*, edited by Jentery Sayers. University of Minnesota Press, 2018. https://doi.org/10.5749/j.ctt1pwt6wq.

Teboul, Ezra "A Method For The Analysis Of Handmade Electronic Music As The Basis Of New Works." PhD diss., Rennslaer Polytechnic Institute, 2020.

Winthrop-Young, Geoffrey. "The Kittler Effect." *New German Critique* 44, no. 3 (132) (November 2017): 205–24. https://doi.org/10.1215/0094033X-4162322.

Further information

For the presentation text, slides, full image credits, links to media resources, and the complete bibliography, please see
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Comments and questions welcome in advance of live Q&A
at <belle2@tcd.ie>

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