



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

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

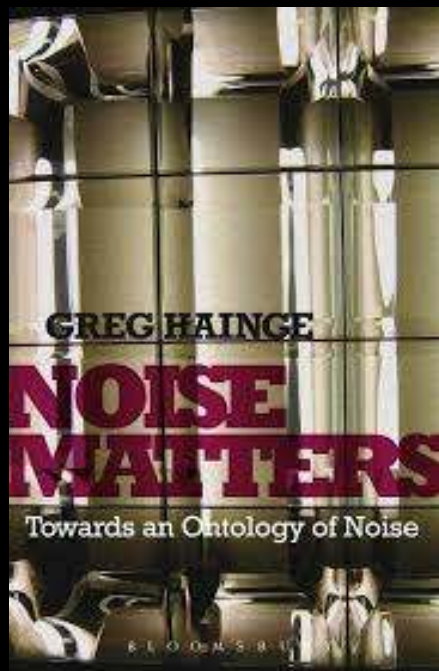
4. Conclusion



(Kelly 2009)



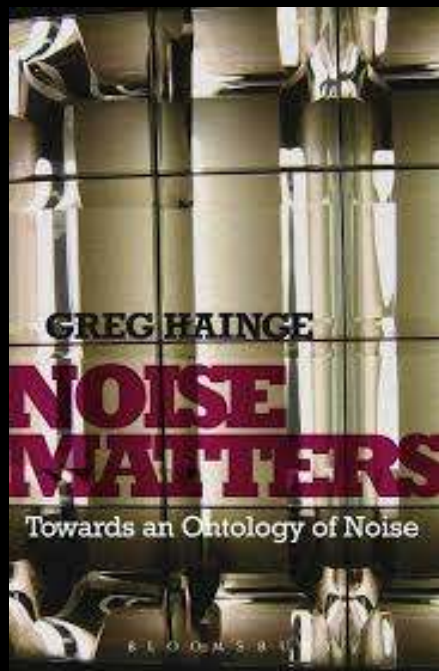
(Kelly 2009)



(Hainge 2013)



(Kelly 2009)



(Hainge 2013)



(Thompson 2017)



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

(Teboul 2018; 2020)

(Nakai 2014; forthcoming)



Media archaeology

(Ernst 2013; 2016)

Kittler “middle period” (*per*
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The Plan

2. On *Broken Light*



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2. On *Broken Light*

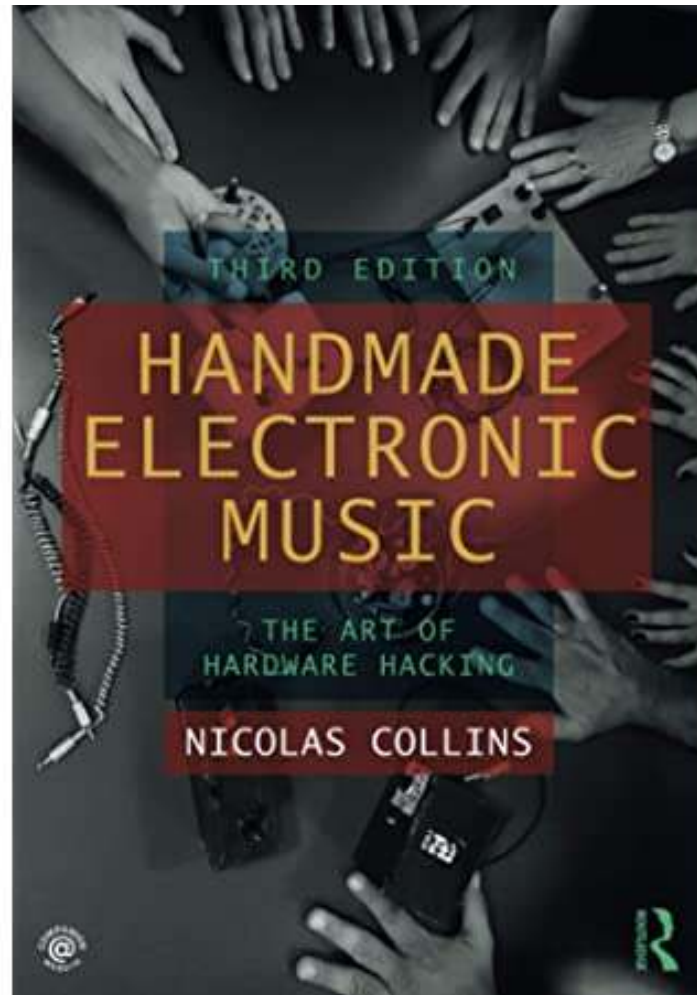


3. On algorithmic policies of sonic control

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

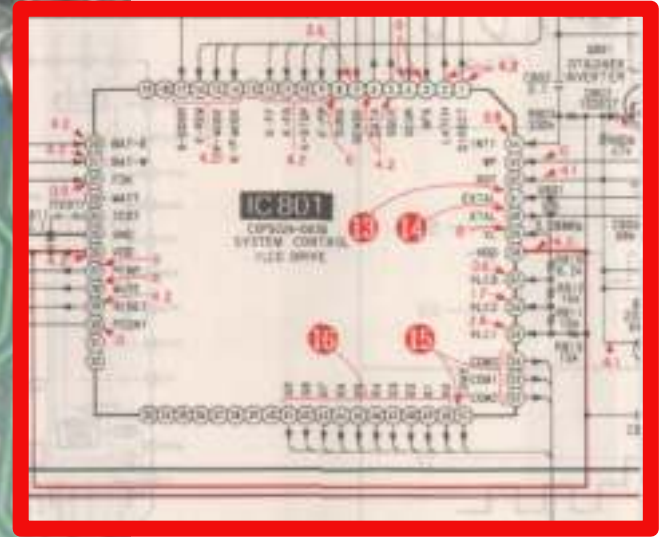


3° edition (2020)

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

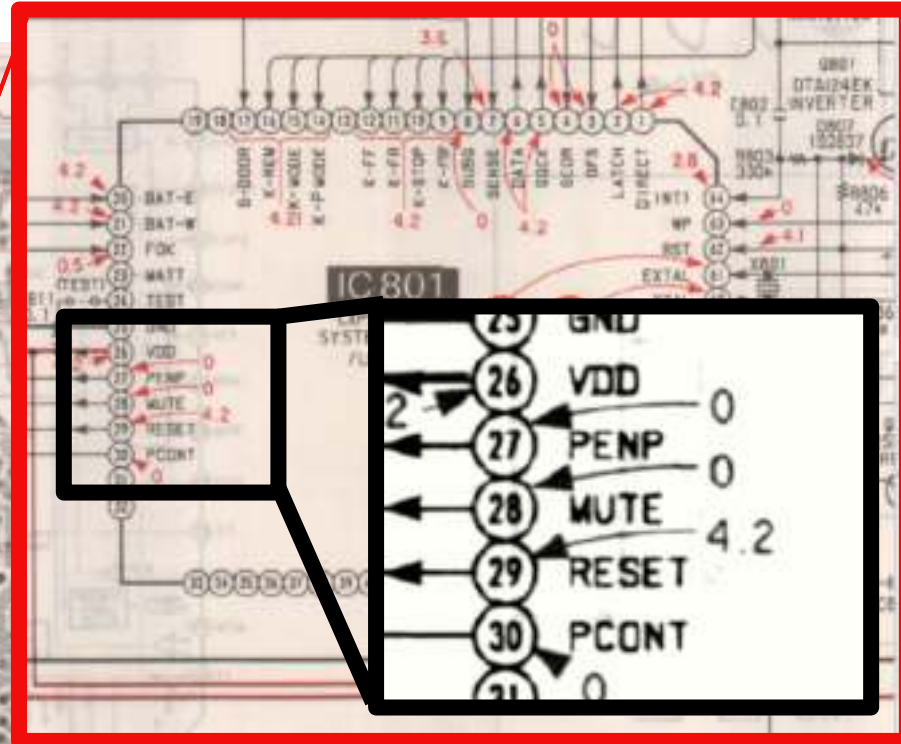


Soldier Quartet. 1983 Lineup.



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





Ref. No.	Location	Ref. No.
Q801	Q1-12	Q802
Q802	Q1-12	Q803
Q803	Q1-12	Q804
Q804	Q1-12	Q805
Q805	Q1-12	Q806
Q806	Q1-12	Q807
Q807	Q1-12	Q808
Q808	Q1-12	Q809
Q809	Q1-12	Q810
Q810	Q1-12	Q811
Q811	Q1-12	Q812
Q812	Q1-12	Q813
Q813	Q1-12	Q814
Q814	Q1-12	Q815
Q815	Q1-12	Q816
Q816	Q1-12	Q817
Q817	Q1-12	Q818
Q818	Q1-12	Q819
Q819	Q1-12	Q820
Q820	Q1-12	Q821
Q821	Q1-12	Q822
Q822	Q1-12	Q823
Q823	Q1-12	Q824
Q824	Q1-12	Q825
Q825	Q1-12	Q826
Q826	Q1-12	Q827
Q827	Q1-12	Q828
Q828	Q1-12	Q829
Q829	Q1-12	Q830
Q830	Q1-12	Q831
Q831	Q1-12	Q832
Q832	Q1-12	Q833
Q833	Q1-12	Q834
Q834	Q1-12	Q835
Q835	Q1-12	Q836
Q836	Q1-12	Q837
Q837	Q1-12	Q838
Q838	Q1-12	Q839
Q839	Q1-12	Q840
Q840	Q1-12	Q841
Q841	Q1-12	Q842
Q842	Q1-12	Q843
Q843	Q1-12	Q844
Q844	Q1-12	Q845
Q845	Q1-12	Q846
Q846	Q1-12	Q847
Q847	Q1-12	Q848
Q848	Q1-12	Q849
Q849	Q1-12	Q850
Q850	Q1-12	Q851
Q851	Q1-12	Q852
Q852	Q1-12	Q853
Q853	Q1-12	Q854
Q854	Q1-12	Q855
Q855	Q1-12	Q856
Q856	Q1-12	Q857
Q857	Q1-12	Q858
Q858	Q1-12	Q859
Q859	Q1-12	Q860
Q860	Q1-12	Q861
Q861	Q1-12	Q862
Q862	Q1-12	Q863
Q863	Q1-12	Q864
Q864	Q1-12	Q865
Q865	Q1-12	Q866
Q866	Q1-12	Q867
Q867	Q1-12	Q868
Q868	Q1-12	Q869
Q869	Q1-12	Q870
Q870	Q1-12	Q871
Q871	Q1-12	Q872
Q872	Q1-12	Q873
Q873	Q1-12	Q874
Q874	Q1-12	Q875
Q875	Q1-12	Q876
Q876	Q1-12	Q877
Q877	Q1-12	Q878
Q878	Q1-12	Q879
Q879	Q1-12	Q880
Q880	Q1-12	Q881
Q881	Q1-12	Q882
Q882	Q1-12	Q883
Q883	Q1-12	Q884
Q884	Q1-12	Q885
Q885	Q1-12	Q886
Q886	Q1-12	Q887
Q887	Q1-12	Q888
Q888	Q1-12	Q889
Q889	Q1-12	Q890
Q890	Q1-12	Q891
Q891	Q1-12	Q892
Q892	Q1-12	Q893
Q893	Q1-12	Q894
Q894	Q1-12	Q895
Q895	Q1-12	Q896
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Q897	Q1-12	Q898
Q898	Q1-12	Q899
Q899	Q1-12	Q900



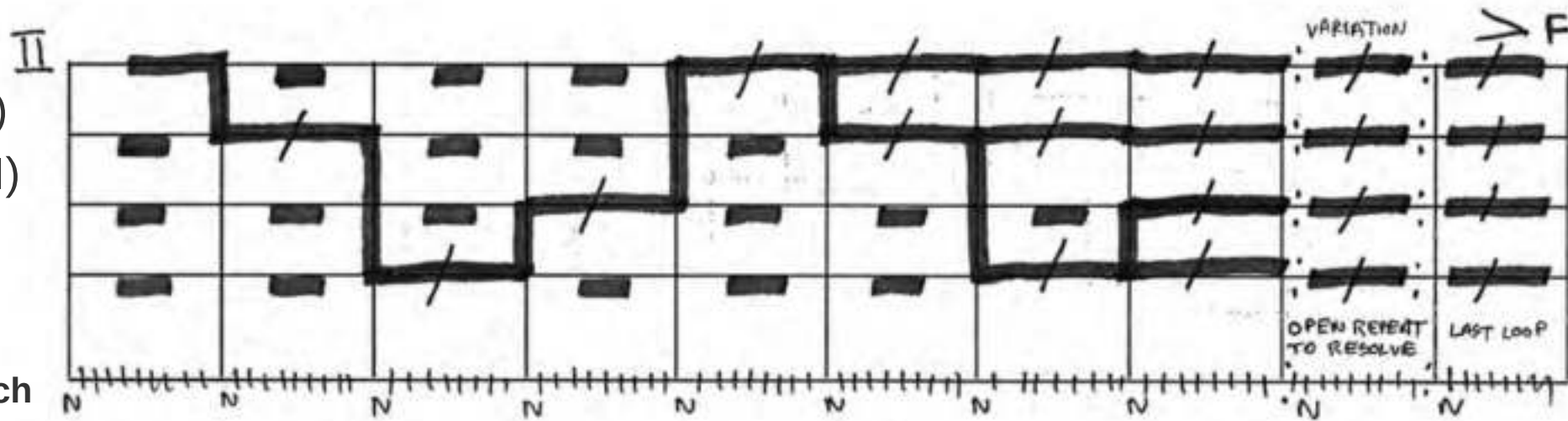


Set-up for *Broken Light*, showing hacked Sony D2 Discman; modified Sony remote control (in blue box); breakout box for connecting footswitches to remote control; footswitches to call up tracks for three movements ("1", "2", "3"), scratch across CD ("S"), and nudge through tracks ("N"). (Collins 2009)



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)

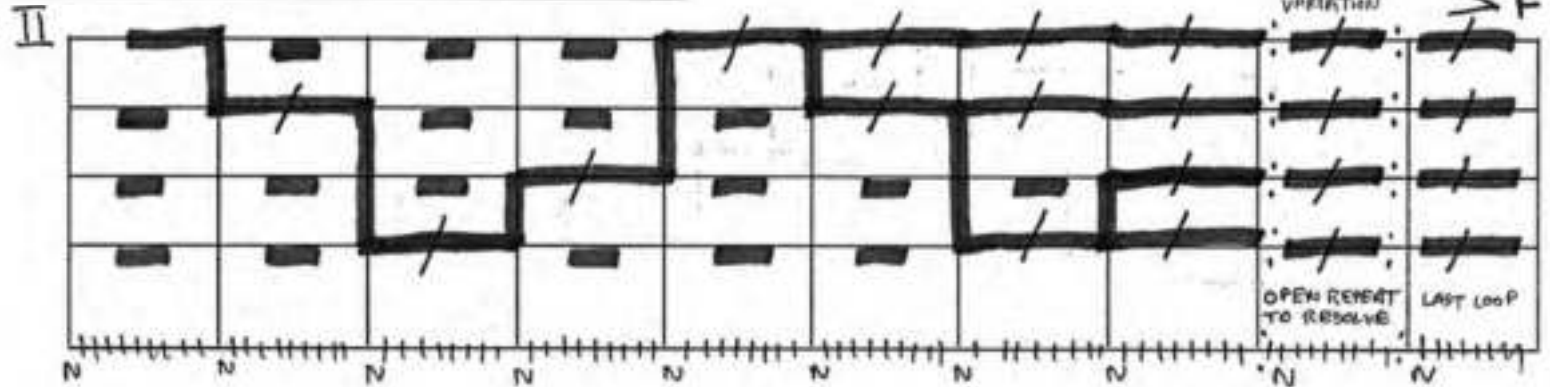


Detail from score for Nicolas Collins, *Broken Light* (1991, rev. 1992)

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
 Step 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)

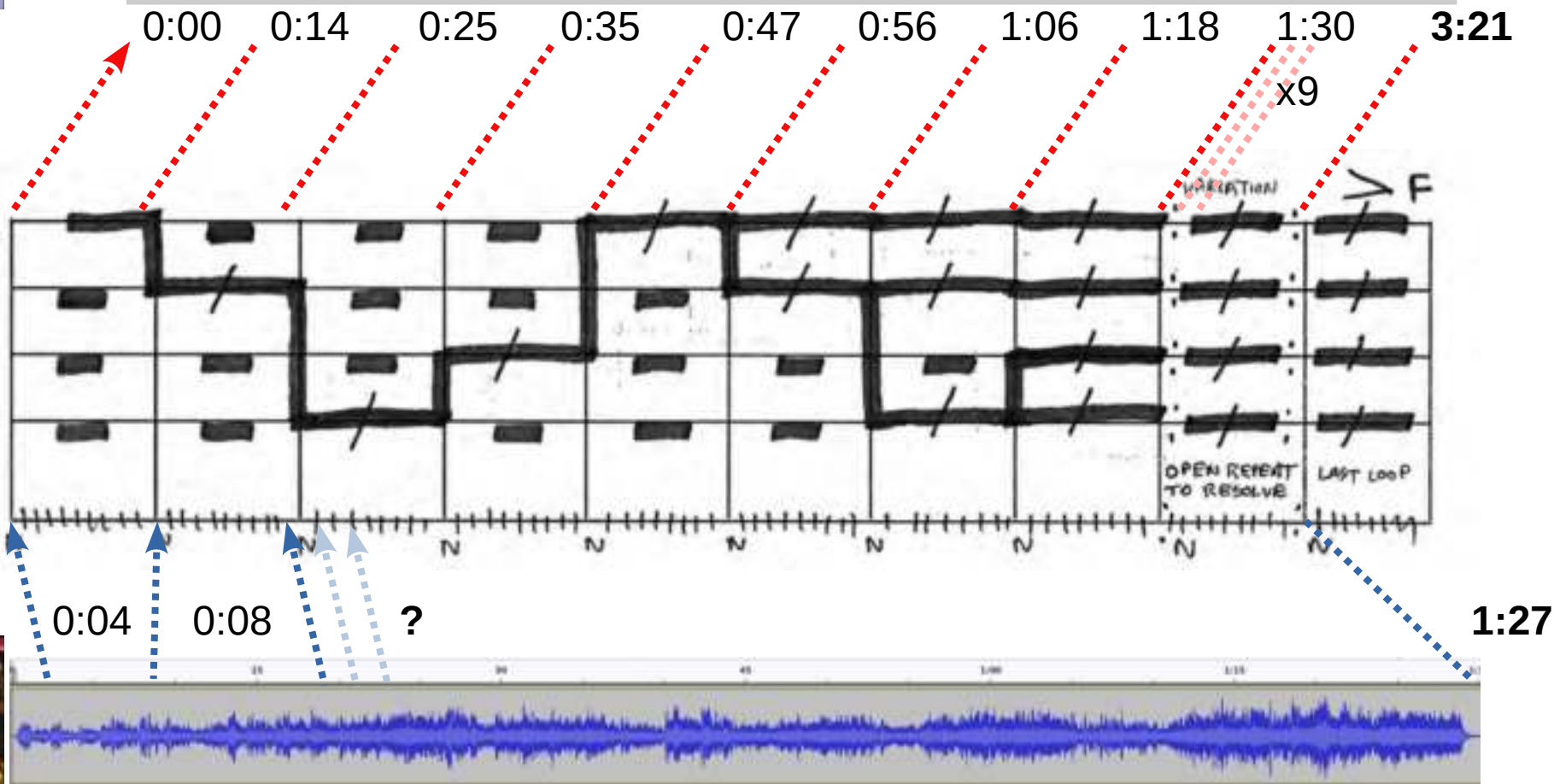
It Was a Dark and Stormy Night

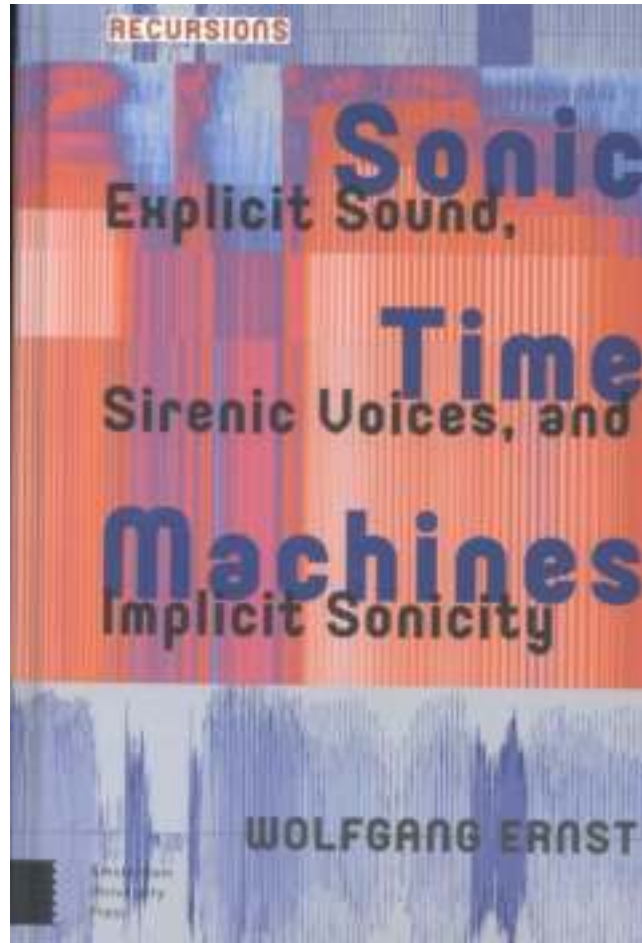
Trace Elements Records, 1997



■ ■ ■ ■ ■ Footswitch press (“Nudge”) [time in recording of *Broken Light*]

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





(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



Image credit: British Library

“CDs featured certain conveniences that transcended the other available modes.”

(Plasketes 1992, 112)



Philips CD 104 interface

Sony CDP-101 interface



Image credit: British Library

“CDs featured certain conveniences that transcended the other available modes.”

(Plasketes 1992, 112)

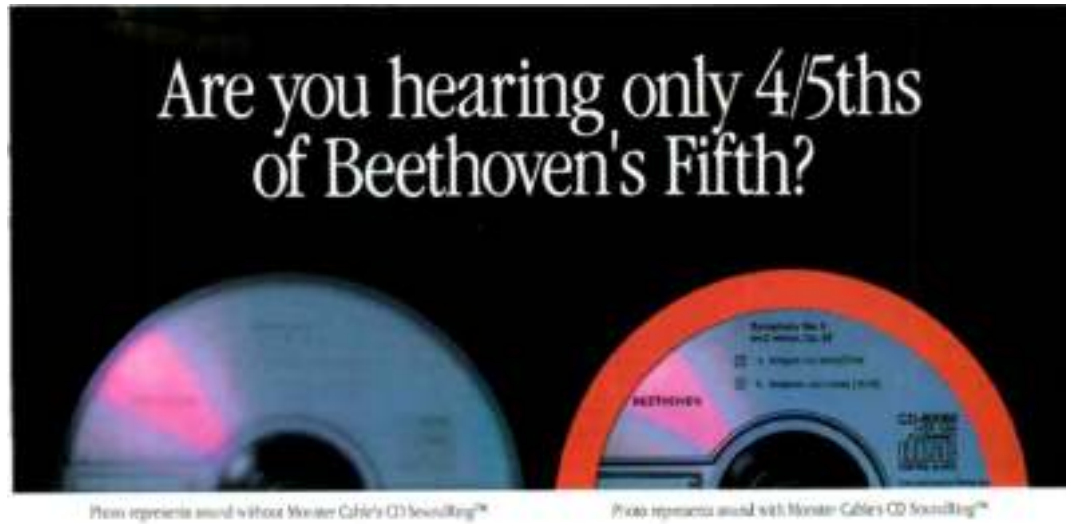


Philips CD 104 interface

“[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)



Sony creates seventh row, center. Forever.

INTRODUCING THE SONY COMPACT DISC PLAYER

The invention of digital audio processing is destined to cause the revolution in the CDP-G1. Pioneered by the discs circulating here in High Fidelity as "The most fundamental change in audio technology in more than sixty years."

There are compelling reasons for such optimism.

The CDP-G1, based on the world's first compact disc system developed by Philips and Philips of Holland, offers compact disc playback from standard audiophile and other audio sources. Plus an awesome dynamic range exceeding 100dB. It's giving you the full

history of music in the Music Room as never before.

This segment of history remains faithful, unaltered. The digital device used by laser beams, there's none of the physical wear associated with tape or vinyl. While the CDP-G1 regenerates signals, it's not just a matter of being there.

Especially important, an individual version of each disc is yours. No more tracks without background from your armchair. Yet for all its sophistication, the CDP-G1 is remarkably compact and easy to use.

We suggest you have the CDP-G1.

son. For it would you start believe from the audio provided you directly son.

SONY
THE ONE, AND ONLY



© 1983 Sony Corp. of America. Sony and Compact Disc are trademarks of Sony Corp. in the U.S. and other countries. SONY, THE ONE, AND ONLY are registered trademarks of Sony Corp. in the U.S. and other countries.

"...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.



Sony prototype digital audio compact disc player "Goronta" c. 1981.



Sony CDP-101. Released 1982.

Philips TDA1541A [DAC]



Philips/Signetics SAA7000 [concealment]



Sony Discman D-20
Main PCB





Policies of sonic control

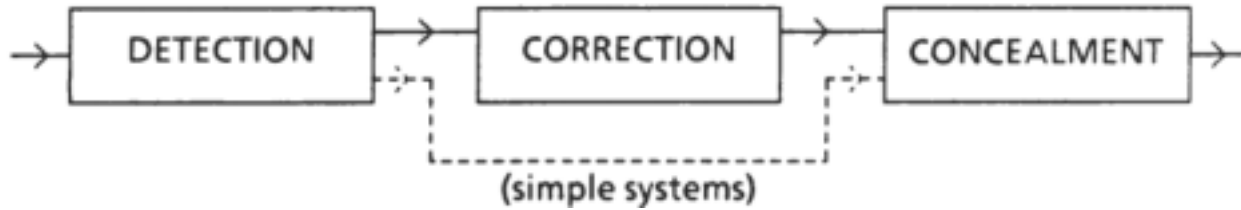
- regulate what and when the data that the medium inscribes is understood as sound and what and when it is understood otherwise



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-description” (Akrich 1992)

Correct, *then* conceal

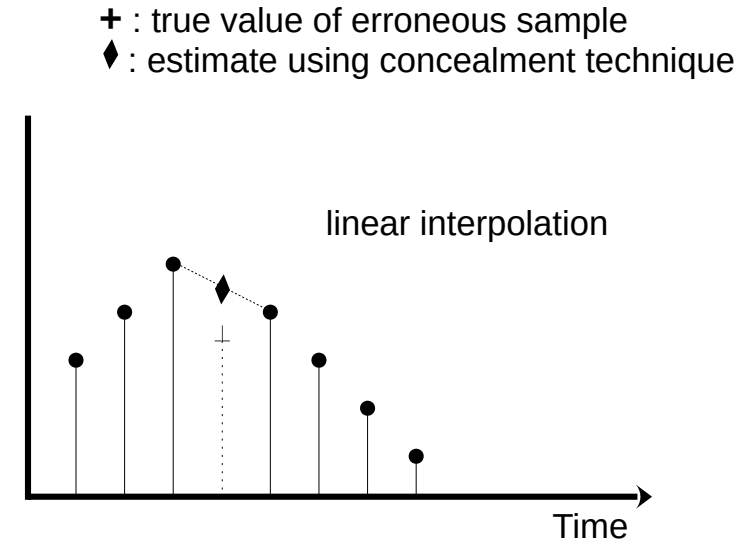


(Sleight and Tutton 1990, 4.3)



Error concealment

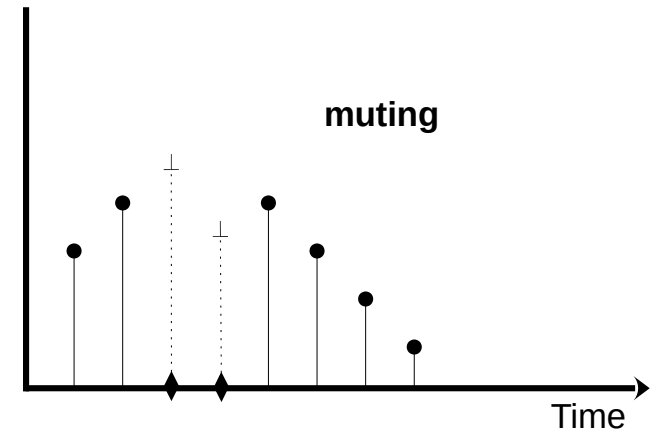
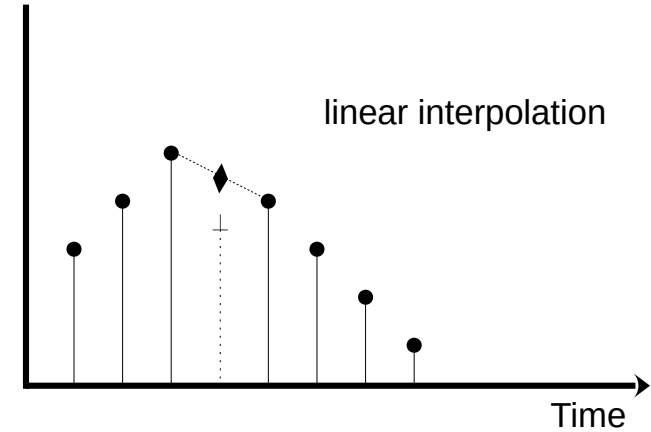
- Used when CD error-correction (CIRC) fails
- Two main strategies
 - interpolate (guess)



Error concealment

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

+ : true value of erroneous sample
◆ : estimate using concealment technique





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)

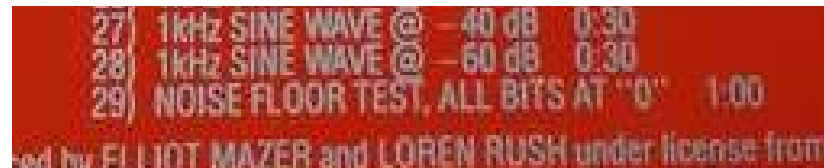
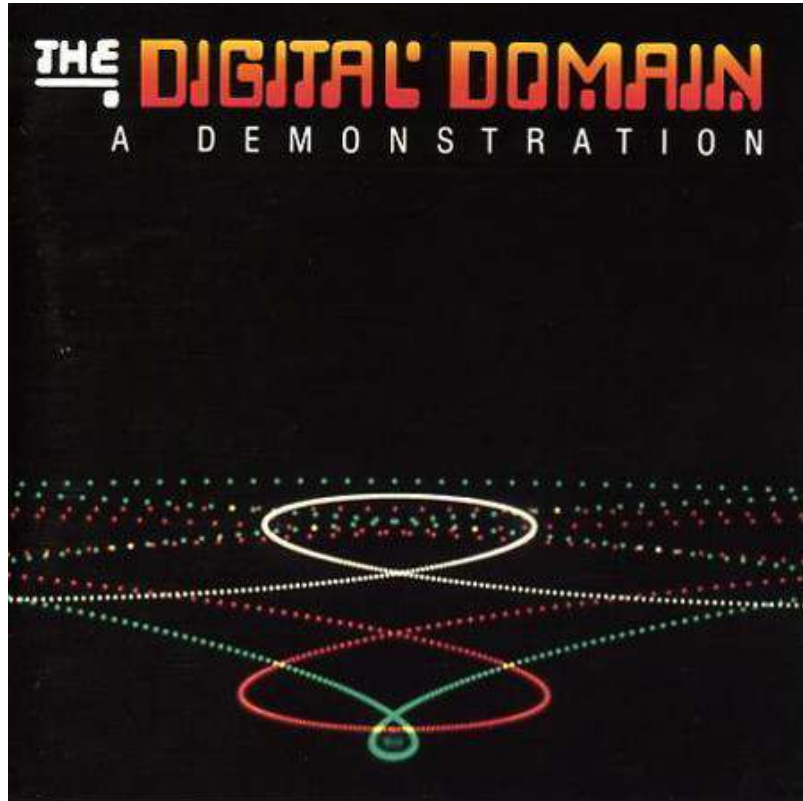
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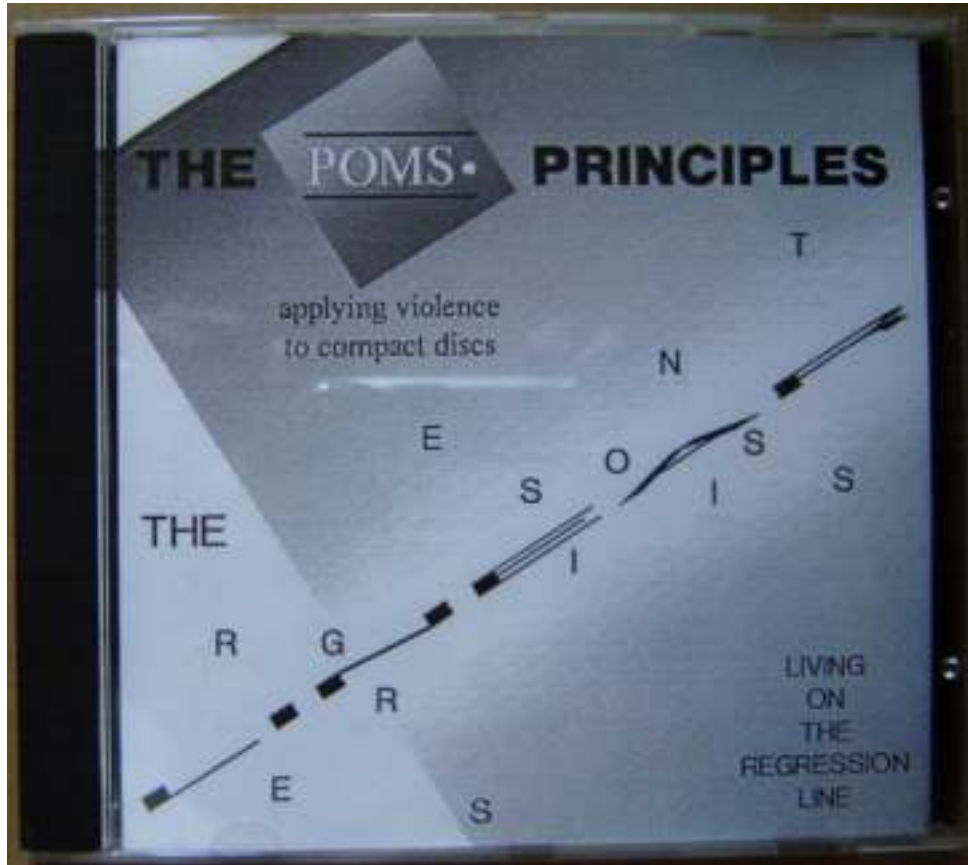
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Various Artists, The Digital Domain: A Demonstration. Elektra 9 60303-2, 1984. CD.

(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)

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at <belle2@tcd.ie>



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