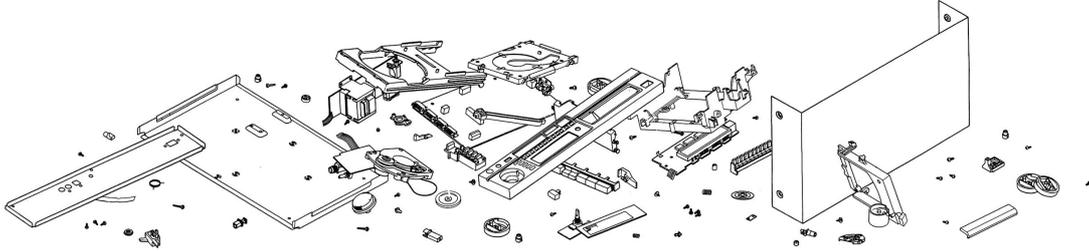
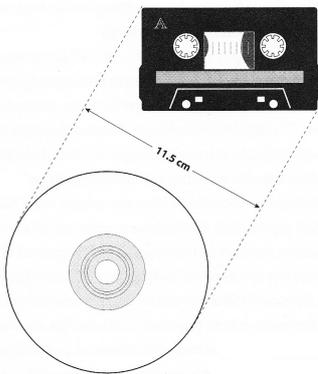


Having Opened a CD Player

Stephen Cornford



In their essay *Zombie Media*¹ Garnet Hertz and Jussi Parikka ask: “What does a media archaeology of consumer objects look like if instead of going back in time to media history, we go inside a device?” Whether it is possible to go inside a consumer device without simultaneously going back into media history is another question. Having opened a hi-fi CD player, for example, left me with one overwhelming realisation which can only be explained by media history: the amount of empty space. In some models as little as one third of the internal volume is taken up with circuitry and mechanics, leaving the majority of the space empty. The size of the box is not determined by the size of its internal components and yet it is standardised.



The CD player is a relatively late entrant into the world of separate hi-fi systems, designed to stack neatly but allow listeners to combine individual units of their choice. The CD player therefore owes its outer dimensions to the pre-existing measurements of hi-fi units, calibrated to fit beneath a record-player. If, as Jonathan Sterne suggests in *MP3: The Meaning of a Format*², the decision for a Compact Disc to be 12cm across can be explained by the 11.5cm diagonal measurement of a cassette, then the hi-fi CD player is, at least in its measurements, a compromise of the media landscape that it is born into: a format the size of a cassette, in a machine big enough to play an LP. Or, in the eloquently cynical words of Baudrillard:

The various technological objects tend, independently of man, to become organised by themselves, to refer to one another in the uniformity of their simplified praxis, and thus come to constitute an articulated order, pursuing its own mode of technological development.³

Opening this device then is far from an alternative to media history, but a shortcut.

But maybe history is here a misnomer, because really this is our media present. In audio terms three physical media have survived, and all cling on solely through the enthusiasm of their end users; the mainstream record business now barely has need for sales of physical media. Yet the record, CD and cassette are not and never really have been dead media. While several high profile brands have ceased production of

playback machines⁴, new machines for all three formats remain in production today. Although few duplication services for cassettes remain, those that have survived are consistently busy with trade from independent record labels; and vinyl pressing, although it will clearly never reach the scale of the LP's heyday, has never gone away. At the time of writing one Central European pressing plant is turning away new customers, unable to keep up with the demand. Compact Disc production, by contrast, has recently joined cottage industry status as businesses spring up offering low number runs of glass mastered CDs, bringing its status as a media format in line with its predecessors.

These media are all obsolete as far as the market is concerned, yet they persist. The last century's enforced top-down media 'progression' has now unraveled and two obsolete media have experienced a renaissance thanks to the multitude of small independents who have kept them in circulation. And in their persistence these media are changing, their roles are changing, their meanings are changing:

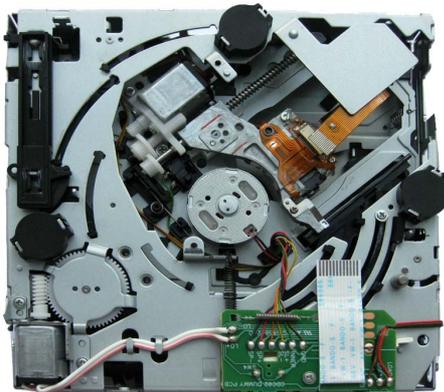
By seeking, collecting and sorting the archaeologist attached meanings; and these meanings may be different from the ones the objects had originally. (Zielinski, p.27)⁵

The meaning of vinyl was not the same to the artists and audiences of classic era rock n'roll as it was to those same demographics of 90s dance music. But the meaning of a medium in one era is not erased by its more recent uptake. As a medium persists across time, cultures grow up around it, claim it as their own, attach their own significances to it and (more often than not) move on to another medium when it makes economic or logistical sense. As a medium matures therefore, it accrues meaning and significance to different generations. I distinctly remember, for example, the absence of vinyl in HMV Oxford Street between the cessation of LP sales in the 1990s (when the compact disc had firmly taken hold) and the numerous racks of 12" dance singles which filled the same space not many years later. Just as the arrival of the latter did not directly replace the former physically nor does it annul or even change its previous meaning. The formats may look the same when placed on the turntable but in numerous signifiers other than their shared materiality, the dance 12" and the Rock LP are distinctly different animals.

Often holding just two tracks and cut at 45rpm over a whole 12" side (to maximise volume and quality for playback on club PA systems) the dance 12", in all but its size, resembles more a descendant of the 7" single than of the LP. If we add the observation that they were frequently packaged in a generic label sleeve with a hole cut in the centre to display the artist name and track title on the sticker, then the visual similarity becomes complete. A further comparison might also be drawn between the two formats' cultural importance to two quite different types of disc jockey: radio and nightclub. Now that so much of DJ culture has joined the digital revolution, albeit often through the interface of a mediating record surface such as Final Scratch, the meaning of vinyl begins to accrue still more depth and breadth. And as Zielinski suggests none of these currently understood meanings of this persistent medium may be the most pertinent when looked back on in 100 years time. The media archaeologists of the future might for example look upon vinyl's means of data storage and access: a flat disk with information etched in a continuous spiral towards the centre, accessible at any point by the drop of a needle; perceiving this foreshadowing of the digital hard drive's operation as more significant than the impact of the LP on changing the listening habits of the public (although quantitative comparisons of the technical and social aspects of media are rarely informative).

In terms of its changing contexts and accruing meaning the CD is anomalous among audio media due to its (albeit brief) status as the universal medium of consumer data storage. So although it was invented solely for audio storage, it has accrued a parallel history in which it has more in common with the Floppy Disc than with the LP that it was initially designed to replace. This duality of use may have been pre-empted by the use of tape in mainframe-era computing and the cassette's use for data storage in early home computers, but here the blank medium was never widely written by the user. Hence the cassette never became as devalued and disposable as the CDr would – as confirmed by the sight of CDs dangling over allotments as new media scarecrows. There are of course exterior factors which played their part: such as the CDs' arrival in an environment in which the means of production traditionally available only to industry or as retail services were, through software sales, increasingly being marketed to individuals as consumer products. But in becoming the standardised format for computer users, a disc on which a few jpegs and documents could be conveniently and cheaply saved, exchanged, or posted, the CD lost the sense of reverence that is crucial to the album as an object, regardless of format. This may, in part, explain why even today album sales of vinyl LPs persist in a market in which CD purchases being replaced largely or even entirely by digital sales seems almost inevitable.

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Having opened a CD player something else we might notice is the position of the motor: right in the centre of the disc, directly driving its rotation. Seen in isolation this might appear an insignificant observation, but seen in comparison with other audio media here the CD sets itself apart. Of course the motors of both tape and vinyl players also power the media's motion, but where their belts and gears enable an unwavering consistency of revolutions per minute or inches per second, accessing data from a CD requires the motor to vary its speed depending on which area of the disc it is reading. There is therefore a complex relationship between medium and voltage in which speed of rotation varies to ensure the consistent

delivery of data, rather than the simple reciprocity of analogue systems in which the correlation between speed of audio and speed of motor is direct.

The information about how the CD player should play the disc is inscribed on the disc itself: its lead-in, its meta-data, its lead-out. The CD player is therefore the first audio technology able to perceive its own emptiness, except that as we have all experienced the machine sometimes gets this wrong, often suggesting that a blank or illegible disc is not in fact there. Perhaps the ubiquitous 'no disc' message should be replaced with one saying 'no data'. But, pedantry aside, this self-awareness distinguishes the CD player from its colleagues in the hi-fi world. Friedrich Kittler considered the earliest of sound recording media: the phonograph, to already mark "an unimaginable closeness of sound technology and self-awareness"⁶ in its ability to both play and record. The auto-stop mechanism common to both record players and cassette machines could be seen to mark the beginnings of the playback machine's awareness of its contents, but the CD player far surpasses these simple, mechanical

attributes. It will not, for example, attempt to play a circle of clear plastic or metal as a distinguished list of avant-gardists have done with a turntable, nor will it amplify ferric objects that are waved in front of its laser, as does the electromagnetic pick-up in a tape machine. Wolfgang Ernst may warn against the anthropomorphism of media machines, calling us to “be aware that at each technologically given moment we are dealing with media not humans”⁷ but it is hard not to do so when the machine in question appears capable of making a whole series of near-value-judgements. Not only does it discriminate between discs it will play and those it won’t (I am sure several artworks would by now have made use of the machine’s ability to ‘play’ a blank disc, if only it were able to) but it is also the only machine that can ‘give-up’ playing a disc if it is unable to reproduce the data stored on it. As Nicolas Collins’ notes in writing about his work *Sled Dog*⁸ (a discman hacked so the CD may be manipulated in the same manner as a DJ does vinyl) the player has built-in circuitry to mute itself during processes which create machine noise, or, in Jonathan Sterne’s language *exterior* sound⁹. This ability to self-censor, to distinguish between its media content and its own machine-noise-artifacts and to silence the latter is one which could not even have been dreamed of by phonograph engineers like Charles Sumner Tainter whose quest for a truly transparent medium was perhaps first realised by the compact disc.

If the phonograph could hear itself it would learn to recognise the difference between the voice that came from the outside and forced itself on it and the voice that it itself is broadcasting.¹⁰

The automated mute function of the CD player, this ability to override the audible reproduction of its own machine noise appears to our ever anthropomorphic thoughts to be exhibiting exactly this ability to distinguish between sounds, which Kittler implies is the only thing preventing the phonograph from realising consciousness.

Both Kittler and Sterne draw distinctions learned from listening to media. The timbral difference between the *outside voice* and the *broadcast voice*, observed by Kittler, is now commonly used in cinema and television soundtracks to denote a cut between the real life event and its mediated appearance. However transparent our means of playback may become we will always be able to distinguish the voice from the voice coil. Sterne, picking up the language used in the listening tests made during the development of the phonograph, separates *interior* from *exterior*, the recorded content from the artifacts of its reproduction. Within Sterne’s category of *exterior* a further distinction could be made: between those sounds produced by the mechanical apparatus during operation and those that result from the transcription of stored data into sound: between the hum and rattle of the mechanism, and the surface noise of the medium. A distinction which lies closer to that drawn by Craig Dworkin between *substrate* and *inscription*¹¹. To apply this in practice is, on occasion, to have to distinguish the sibilance of amplification from the hiss of a blank cassette, yet it is exactly such a distinction that the CD player performs every time we press its buttons.

To listen media archaeologically is to pay attention to the electronic message of the acoustic apparatus, not primarily to its musical content as cultural meaning.¹²

If then, as Salome Voegelin has recently noted, our sight brings us an intellectual understanding of the world, informing our rational knowledge from the position of safe distance while our hearing immerses us in our subjective engagement with the

world around us¹³ then what might a media archaeology of audio technologies be if, rather than looking to media history, or even inside of our devices, we just listened to them, to their mechanisms and to their substrates, to the interior world of their “exterior” sounds? How might our thinking about these machines change if we gave them the attentive ear that we have for more than a century bestowed upon their pre-recorded contents?

To listen media archaeologically to a CD player can be approached by listening to its acoustic vibrations, or, following Ernst, by listening electronically (or rather electromagnetically) using an induction coil. This listening instrument’s origins lie in the unforeseen need to enable recording of that most ubiquitous sound reproduction technology: the telephone. Yet in recent years it has found a new context in the sound arts through its ability to ‘hear’ (or as some would have it – sonify) electromagnetic fields. Taking our archaeological lead from these sounds brings the CD player into a family of digital, data-oriented technologies whose electromagnetic emissions bear these same traits; thus aligning the compact disc more in its role as a second-generation floppy disc than a musical format. If we were to locate the CD player in media history based solely on listening to it in this way then we would hear it as part of a family of mobile data devices. Apprehending the discman with our (electromagnetic) ears reveals it to be as much a portable data reader of the pre-Internet age as our eyes have always presumed it to be the last gasp of portable playback for physical audio media.

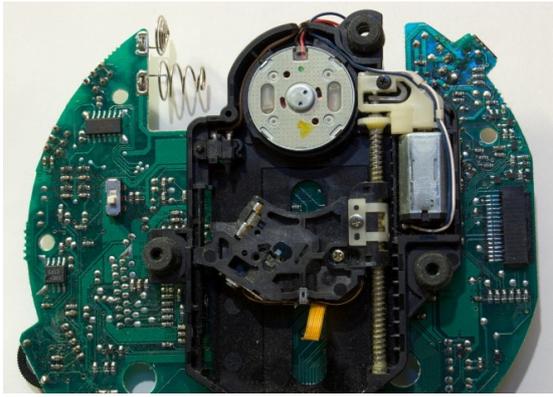
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Having opened our CD player we might also notice that it smells of stale smoke, that the rectangular slot from which the disc tray emerges is stained with nicotine around its edges, and now the temptation to anthropomorphise becomes strong. Does the reaching out and pulling back of the disc tray, which I have always thought a manual gesture, actually amount to a machinic breathing? But this is neither tongue nor outstretched palm. Having now opened more than 50 second hand CD players this is a rare (and superficial) example of its previous owner affecting the machine. Media devices do not grow to resemble their owners. The characteristics of machines, those in which they demonstrate their true individuality, are those that evade the quality control process of standardised functionality, those that become apparent only when the machine is put to another use.

And having opened 50 second hand CD players, other details come to light. Of the 50 there are about a dozen which are identical on the inside but whose casings vary slightly and bear the familiar high street brand names of late twentieth century Britain: Dixons, Currys, Woolworths. And here we learn something not about media history but about the global economic background noise from which these apparatuses emerged. These identical circuits sold in different shades of black-silver plastic by opposing retailers tell us of the existence of a market for the production of consumer electronics which operates outside of the Western brand operated factory model.

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Having opened our CD player we might also notice that its transport, the mechanism which drives the motion of the disc, contains not one but two motors. The second, smaller motor drives the laser assembly perpendicular to the rotation of the disc above it, pushing it outwards from the centre during playback. And here yet again the



CD is peerless among audio media but one among many as a digital data device. For while tape heads and record cartridges all rely to some extent on motion in order to translate the stored contents into a live signal, in neither case is this motion active and reliant on information embedded in the format. By contrast in both magnetic floppy and hard drives the reading head is manipulated by the actions of the user to retrieve the relevant data.

We might then characterise a cassette head as *static* because its only motion is to be thrust into the path of the rolling tape by the play button. And we could similarly characterise a record cartridge as having *passive* motion as it is drawn around the spiral of etched audio simply by virtue of resting in the groove. While this latter bears some similarity to the motion of the optical-laser-assembly whose motion also responds to the data encoded on the disc, in the case of the CD the machine plays an active role, similar to the slider arm of a magnetic hard drive disc, and it is the potential of this active reading / writing head to search and retrieve among its contents which makes the CD so suitable for data storage. The trajectory of the CD, from audio to data, its seemingly inevitable imminent collapse as a mainstream commercial music format was perhaps inscribed in its technological specificities from the start.

We have to follow the things themselves, for their meanings are inscribed in their forms, their uses, their trajectories. It is only through the analysis of these trajectories that we can interpret the human transactions and calculations that enliven things. Thus, even though from a theoretical point of view human actors encode things with significance, from a methodological point of view it is the things-in-motion that illuminate their human and social context. ¹⁴

Opening our CD player with both our eyes and our ears demonstrates that within this once ubiquitous machine both the past and future are folded. A format which aimed to outstrip its predecessors was nevertheless designed to be compatible with them. But in its digital mode of data storage, in its active reading head and in its meta-data the CD player also tells us of a future unimagined by its designers, one in which its primary role was as an intermediary between a world of physical formats and one of file formats.

- ¹ Hertz & Parikka; *Zombie Media: Circuit Bending Media Archaeology into an Art Method*; Leonardo, Vol. 45 no. 5 2012; pp.424-430
- ² Sterne, Jonathan; *MP3: The Meaning of a Format*; Duke University Press, 2012; p.12
- ³ Baudrillard, Jean; *The System of Objects*; Verso, 2005; p.53
- ⁴ Technics have stopped production of its 1200 series turntables and Sony similarly of Walkmans.
- ⁵ Zielinski, Siegfried; *Deep Time of the Media*; MIT Press, 2006; p.27
- ⁶ Kittler, Friedrich; *Gramophone, Film, Typewriter*; Stanford University Press, 1999; p. 37
- ⁷ Ernst, Wolfgang; *Digital Memory and the Archive*; Minnesota Press, 2013; p.183
- ⁸ <http://www.nicolascollins.com/texts/cdhacking.pdf>
- ⁹ Sterne, Jonathan; *The Audible Past: Cultural Origins of Sound Reproduction*; Duke University Press, 2003; p.283
- ¹⁰ Kittler, Friedrich; *Gramophone, Film, Typewriter*; Stanford University Press, 1999; p. 32
- ¹¹ Dworkin, Craig; *No Medium*; MIT Press, 2013; p.104
- ¹² Ernst, Wolfgang; *Digital Memory and the Archive*; Minnesota Press, 2013; p. 68
- ¹³ Voegelin, Salome; *Listening to Noise and Silence*; Continuum, 2010, pp. 3-4
- ¹⁴ Appadurai, Arjun cited by Henning, Michelle; *New Lamps for Old: Photography, Obsolescence and Social Change*; in Acland, Charles; *Residual Media*; University of Minnesota Press, 2007; p.50