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Tape-in

The interest for lost media practices and materials appears intrinsic to contemporary popular and maker culture – a post-digital culture that through vinyl, cassette tapes, print, chemical photography, etc. revisits a time before the digital revolution. How are we to perceive this re-investment in history and old technologies? It is obvious to regard this as nostalgia and a trendy taste for lo-fi. However, the aim of this article is to develop an understanding of how these practices also express a critique of contemporary digital culture. This critique feeds on two competing perspectives on the materiality of media technologies: historical materialism and speculative realism, and hence also two perspectives on artistic media practice as a form of research.

In the summer of 2013, The Consortium for the Preservation of Cassette Tape presented CASSETTE MEMORIES, 'a media archaeological excavation of the cassette tape and its use – from a human and tape perspective' (a workshop at Roskilde Festival, initiated by Andrew Prior, Morten Riis and Søren Pold in collaboration with Roskilde Libraries).i The workshop explored the overlooked sound archives of cassette tapes residing in closets, second hand shops and flea markets, and invited participants to disassemble, cut-up, loop, remix old cassette tapes, and through practices that we often associate with new media this discover the materiality of an obsolete medium.
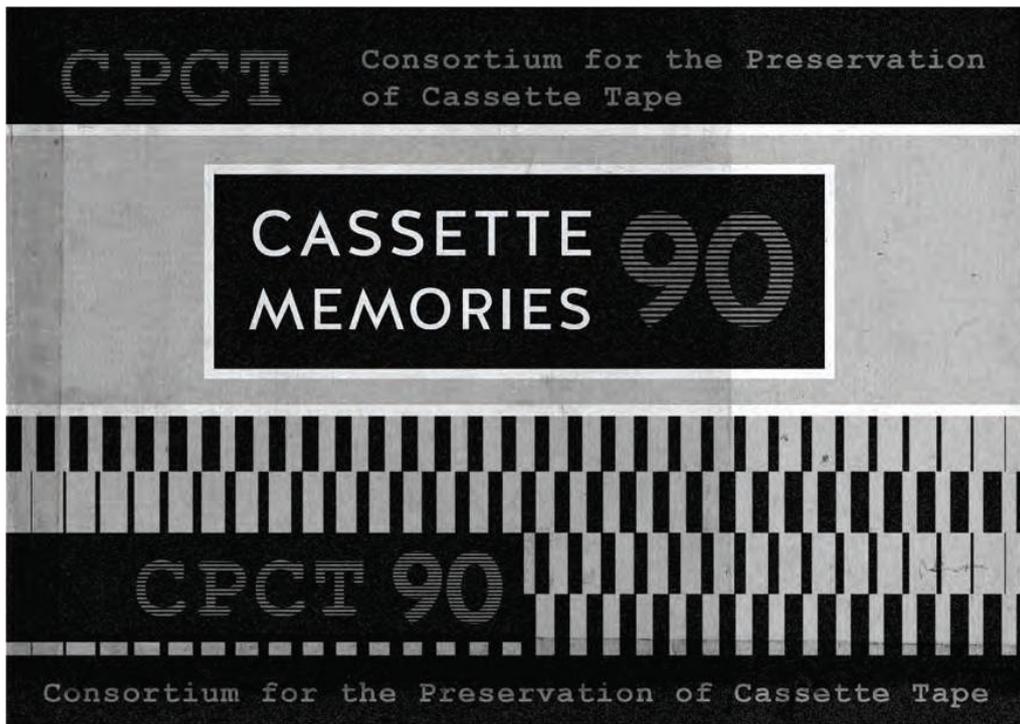
First of all, following the perspective of a historical materialist, we ask how to perceive history? Cassette tapes are deeply associated with our childhood memories of recording voices, listening to music and creating mixtapes. As such, they express our past memories, as well as recollections of poor signals and

incompatible noise reduction. However, the desire for the old is not merely nostalgia for a lost aesthetics; rather, it implies an alternative view on history – the memory of the past itself. In this perspective, excavating the past is an attempt to challenge the techno-social constructions of contemporary interface culture. In short, interface culture has been subsumed under a strictly monopolizing business model that is characterised by a shrink-wrapped agency and tight control of consumption (Striphas; Andersen and Pold, "Controlled Consumption..."). Inquiring lost media technologies establishes imaginary correspondences with past practices and production modes that only exist in our memory.

Secondly, following the perspective of the speculative realist, we ask whose memory? On the one hand, vinyl records, cassette tapes, floppy disks and so forth are media that contain human memories as texts, sounds and images. However, on the other hand, following an inquiry into the poetics of materials and how our memories are stored through for instance phonography and magnetism, the technologies also seem to remember the humans. In other words, a reinvestment in old media is also an excavation of the materials' own reality.

Both the perspective of the historical materialist and that of the speculative realist seem to provide an explanation of a post-digital and critical investment in Jurassic technologies. But, to what extend are the two perspectives compatible? Can the historical materialist understand the perspective of the material? Can the perspective of the material reveal a critique of history? We do not seek a clear answer to these questions in this article, and it can also be argued that any attempt to create a written argument will challenge the attempt to understand practice as a an ontological endeavour, and a way of understanding a material level of things (what is referred to as 'carpentry' below). Following this, we are interested in establishing a dialogue between two cassette tapes, between material and culture, and explore when and how the two communicate. "Cassette A" represents how the cassette tape as a material remembers us (speculative realism). "Cassette B" represents how we remember cassette tapes, and how our memories of material practices reflect the subsumption of interface culture by controlled consumption (historical materialism). The dialogue between the two cassette tapes is based on fragile timing mechanisms – not linear, nor compatible with digital clock frequencies – and as such, they may get out of sync.

CASSETTE A – Against cassette tapes as representations of the past

By posing the question of how the tape recorder represents and understands the world, we have the possibility to get closer to the actual physical operational technology itself, as an exposition of length, time and magnetism and its way of representing reality. For the scientist, the tape recorder was traditionally used to document and record the sounds of the world, which then could be brought back to the lab for further analysis. These analyses focused on the spoken or auditory content of the tape – as opposed to how the sound of the tape itself understands its surroundings. Later, digital technology made the tape recorder obsolete, but the analysis still focuses solely on the content, making the medium somewhat unimportant. However, there is a different approach, in which the cassette tape recorder is transformed into an object of "carpentry"; a term inspired by the work of Graham Harman and developed further within the object-oriented ontology of Ian Bogost.

CASSETTE B – Against historicism

What is it that the tape records? What does it show us when brought to the workshop? In his essay "Theses on the Philosophy of History" Walter Benjamin writes: "To articulate the past historically does not mean to recognize it 'the way it really was (Ranke).' It means to seize hold of a memory as it flashes up at a moment of danger" (Thesis VI). It seems clear that Benjamin criticizes historicism. We cannot seize hold of the past merely by describing a level that pre-determines a logical course of events. History as 'the way it really was' is more ambiguous (as Benjamin's criticism of the founder of modern, source-based history, Leopold Ranke also indicates). In his theses, Benjamin explicitly addresses historical materialism, and in continuation of this, we propose to explore the revival of cassette tapes as a material history pointing beyond a simple revelation of material and technological determination. This implies that it is not merely the productive forces (our tools, instruments, technology, knowledge, etc.) that define our history as a changing mode of production (tribal, feudal, capitalist, etc.) in a simple one-way – techno-deterministic – direction. In other words, cassette memories are not just revelations of how social relations are most fundamentally production relations; they do not disclose cassette tapes' historical role in the

making of a pro-sumer capitalist system (or whatever one chooses to call it). Technology, and the processing of magnetic signals did not make history and did not define our language and social relations in new ways, nor did any other technology. The technology and material production levels are always met with specific cultural interpretations and practices. Likewise, cassette tapes are used through a myriad of practices that still carry potentials.

CASSETTE A – The carpentry of cassettes

A central term for Bogost, as it is explained in his book Alien Phenomenology from 2012, is the notion of "carpentry", which is described as the philosophical practice of making things. As a philosophical lab equipment carpentry becomes a perspective on creative work that poses philosophical questions (100). In other words, matter is being used especially for philosophical purposes, or, an applied ontology (see also Bogost "Carpentry vs. Art"). This happens because writing is dangerous for philosophy. Writing is only one form of being that exemplifies the assumption that we relate to the world only through language (Bogost 90). At the core of carpentry lies an understanding of philosophy as a practice just as much as a theory: the philosophical practice of constructing artefacts (92). The term extends the ordinary sense of woodcraft, to include any material. Additionally, it lies within Graham Harman's philosophical sense of "the carpentry of things,' a term that refers to 'how things fashion one another and the world at large' (93). However, in Bogost's terminology, carpentry 'entails making things that explain how things make their world' (93). This enables not only theory in practice, but moreover; practice as theory (111).

The term carpentry is unfolded within a larger context of object-oriented ontology or philosophy, which originates from the speculative realism of Graham Harman, Ray Brassier, Quentin Meillassoux and Iain Hamilton Grant. A speculative realist is opposed to "correlationism" – a term used to describe how being exists only as a correlate between mind and world, placing humans at the centre (Bogost 4; Harman). As an example, Bogost refers to Heidegger who claims that objects can exist outside human consciousness, but only become meaningful in human understanding (4). Thus, to be a speculative realist 'one must abandon the belief that human access sits at the center of being, organizing and regulating it like an ontological watchmaker', and instead shift focus to include all possible objects (a flat or tiny ontology): all things exists equally (Bogost 5).

Ultimately, this means that when removing humans from the centre of the equation, more focus is directed towards the various objects that the world consists of (for instance, Bogost investigates what it is like to be a pixel within a computer game).

CASSETTE B – Cassette tape interfaces

Rather than beginning by discussing whether to prioritize the auditory signs of the recorded voices (what the sounds on the magnetic tape mean), or the signals embedded in the materiality of tapes (what it means to be a magnetic tape), we suggest enlightening the relation between the sign and the signal (see Andersen and Pold Interface Criticism). What is a magnetic cassette tape from this perspective? Along with other productive forces and technologies, cassette tapes must be seen as part of the same realm as language, in the sense that also language is material (as on a cassette tape), and this material is in itself a speech act (at the workshop people talked about sending their voices to their loved ones across the Atlantic and about the investment and gesture of recording and giving away a mixtape). A qualitative separation of material signal processing and the media representation is therefore futile. In every way, the material of the cassette tape (the playback head, the noise reduction system, etc.) is as much a social and linguistic construct (including DIN and IEC defined standards and protocols for equalization), as it is the physical manifestation of a representation (of a memory, a voice, a recording). This ambiguous double-nature allows for a critique of the social and political reality of the technology.

CASSETTE A – Magnetic operations

Material that is capable of being magnetised is referred to as ferrous, and the molecules of such a material are linked together in the form of a "crystal structure" (Earl 21). Each complete crystal element contains a certain number of molecules, depending on the material. For instance, ferric oxide (which forms the basis of the coating of Fe tape) has eight molecules per element. The crystal elements can be regarded as domains of randomly oriented magnetic fields. When the material gets magnetised, the domains are swung from their random distributed positions, and then line up. The strength of the resulting magnet is determined by the number of domains in alignment. When all the domains are in alignment, the material is "magnetically saturated". In other words, it is incapable

of accepting further magnetism or producing a greater magnetic field (Earl 22). To capture and record auditory content, the tape recorder is installed with three tape heads: erase, record and playback. Each head contains an electromagnet that can convert an electrical signal into a magnetic force. This force can be stored on the passing magnetic tape, and subsequently convert the magnetic content of the tape into electrical current.

CASSETTE B – The danger of techno-cultural discourse

Techno-cultural discourse leads to the belief that technology represents a history of increased efficiency, and that the conditions of present digital technologies (producing, sharing, mixing, etc.) can maximize individual freedom and social production. CASSETTE MEMORIES challenge these myths. The return to old media holds no essence but expresses awareness of how our material technologies are also signs, and our signs technological, and of how the coupling of signs and material by digital technology leads to a form of control. Following this, techno-cultural constructs cannot be understood as a pure material condition (signals), but nor can they be understood as pure discursive constructs (signs): they are both related to the technologies, but also to the cultures around their use. The post-digital material turn (as seen in CASSETTE MEMORIES as well as other practices) exemplifies – not how materials are more real then signs – but how also our technologies are signs, and our signs technological, and how the coupling of signs and material in technology also incorporates a form of control. In other words, the material turn is a response that seeks to reconfigure the relations between signals and signs – of the material processes of computation, and their social and political realm; of material and social procedures and protocols.

CASSETTE A – The danger of erasure

Each new recording involves a process of erasing old magnetic matter. To erase the content of the tape, a high frequency (approximately 80 to 100 kHz), high amplitude audio signal is sent from the erase head. This signal randomises the magnetic particles on the tape. Music varies in frequency and amplitude, and so does the magnetic field from the record head that imprints the magnetic picture of the audio signal on the tape. When recorded, tape scrolls under the playback

head, and the moving magnetic fields induce a varying current in the head. This voltage produces an electrical representation of the magnetic signal on the tape. Subsequently, the signal is passed through an equalisation and amplification circuit that makes recorded music audible in the connected speakers.

CASSETTE B – Cassette tape allegories

CASSETTE MEMORIES does not hold an essence or a truth but is seen as an allegory. As an allegory, the cassette tape and CASSETTE MEMORIES seize 'hold of a memory as it flashes up at a moment of danger,' to quote Benjamin. It establishes an imaginary correspondence to another historical moment. This is partly a yearning for the bygone, and there is no radical power in looping and cutting up tapes today. However, the imaginary construction also represents another way of experiencing producing, sharing, mixing, etc. than we usually experience in today's interface culture.

CASSETTE A – The "sound on sound button" (or, "the switch of carpentry")

"The switch of carpentry" enables a recording method that does not erase previous content, but superimposes layers of sound upon each other. This "sound on sound button" – which in CASSETTE MEMORIES was build into a modified cassette recorder – disables the erase head of the tape recorder and reconfigures the cassette machine into an object of carpentry. The button provides the possibility to display and monitor the cassette tape's state of magnetic saturation, a state where all possible resources of the ferrous coating on the tape are used. This shows the true personality of the recording medium and its attempt to capture the complex pulsating sound waves of humans talking, walking, playing music, etc. onto the tape. The recorded sounds gradually gets more and more saturated, forcing the magnetic domains in the same direction, but still leaves room to listen to the contours of the previously recorded material, while new recordings get layered up.

CASSETTE B – The cassette tape as a document of barbarism

Benjamin's thinking is an encouragement to think of the renewed interest in the cassette tape as something that flashes up in a moment of danger. The historical materialist must therefore address history differently, as Benjamin puts it: 'There is no document of civilization, which is not at the same time a document of barbarism. [...] A historical materialist therefore dissociates himself from it as far as possible. He regards it as his task to brush history against the grain.' (Thesis VII) With no attempt to recreate a media history, CASSETTE MEMORIES recalls the lost potentials of cassette tapes in relation to a contemporary digital culture. In the words of Benjamin, the cassette tapes are explored as a 'configuration pregnant with tensions' in order to recognize a 'revolutionary chance' and 'blast a specific era out of the homogeneous course of history' (Thesis XVII).

CASSETTE A – Compact cassette time

Time is a crucial factor. When recording on a compact cassette, time is measured in the length of tape played by the tape recorder with an average speed of 4,76 cm/sec. The specific cassette recorder used in CASSETTE MEMORIES is the Philips D6260. According to the service manual, the tape speed can vary up to 3%, making the notion of accurate time questionable.

If time is length – or, more accurately, the execution of length – then the precision of the tape recorder and the idea of an "operative tape recorder" becomes extremely important (which to a great extend references Wolfgang Ernst's notion of micro-temporality). However, things gets even more complex when using a 1 minute continuous loop cassette that superimposes layers upon layers of sound (as it was the case in CASSETTE MEMORIES). This method challenges the notion of documented time (seconds, hours, days, years). Time gets transferred into complex states of recorded time, real time, machine time, past time, tape time (which is the execution of tape length), and creates a compound of different conceptualisations of time that exists as layers on top of each other.

CASSETTE B – Interface culture in the eighties

What does it mean to 'blast a specific era out of the homogeneous course of history', as Benjamin writes? Our own childhood memories of cassette tapes date back to the seventies and eighties. Those were the heydays of compact cassettes, but also a time when cassette culture was gradually supplemented by digital technologies. Cassettes were the material for recording and sharing audio, and with early home computing this was extended to software (e.g., the Commodore 64 (released in 1982), and the Amstrad CPC 464 (released in 1984) both came with cassette decks). In many ways, the cassette tape and the promise of a digital revolution express similar desires, but also tensions.

To advertise the Macintosh in 1984, Apple released a famous commercial video directed by Ridley Scott. In a dystopian future, the Macintosh will save civilization from a totalitarian state with obvious references to both George Orwell's Big Brother and allegedly also the IBM mainframe systems that were controlling the market at the time. The future will not be like Orwell's 1984 because Apple's computer interface will redefine what computing means. It will no longer be an interface for conformity that absorbs the worker, but an interface for individual expression and cultural taste. No doubt, the Macintosh played a central role in a history where computers redefined cultural consumption, communication and the arts. The computer, and not least the smart phone and tablet, has grown to become a primary medium for cultural consumption. In this this sense the digital revolution has out-conquered the cassette. However, the conditions for this success are based on metaphorical interface design, and the control of access to the materiality of the computer. With this, the relations between signal and signs (technology and language) become displaced: What-You-See-Is-What-You-Get, but you never realize the conditions and consequences.

However, cassette tapes may also be seen in line with another digital revolution at the time. It was not only Apple that believed in a digital revolution. Also in 1984, Steven Levy published a seminal book on hackers as 'heroes of a computer revolution'. Levy's hacker ethics included free access to all computers and all information, mistrust to authorities as well as an insistence on beauty and art. In many ways, this ethics has always been in opposition to Apple's ethics. When Apple believed that the digital revolution would happen through user-friendly design and aesthetical and perceptually pleasing hardware and software, hackers turned to the poetics of hardware and software, foregrounding the constructing

elements. This involved both an inquiry into programming and circuit bending, and an inquiry into the social institutions that follow technologies. As an example of this, "hacking" developed criminal connotations, which stands in contrast to the "good" digital revolution carried out through user-involvement in interface design (but with an ignorance to the hacker ethic of respecting people's data). Following this, the re-investment in cassettes is not just an inquiry into the perceptually pleasing experience of the lo-fi from our childhood. The aesthetics of cassettes, in relation to both audio and digital culture, has always also been associated with the poetics of materials and a critical reflection on the social constructions that follow media technologies (the relations between signs and signals). Audio culture is also about the changing materialities of recording, producing and sharing, and as such, CASSETTE MEMORIES is not only a yearning for the past, but also a reflection on the contemporary.

CASSETTE A – OOO, OOP, OOMT <=> micro temporal media archaeology

The self-made "sound on sound button" and the use of looped cassette tapes change the tape recorder's status from a technological object into an object of carpentry, a philosophical lab equipment used to practice philosophy. Layers of sound becomes superimposed upon each other; and furthermore, various notions of recorded time gets superimposed upon each other, making the sound on sound loop tape difficult to analyse in a traditional textual manner, forcing us to shift our analytical perspective towards the actual recording technology itself.

These philosophical questions posed by carpentry reveal an alternative reality of the operational tape recorder. This reality is – following the thoughts of Wolfgang Ernst – somewhat a-historical, meaning that the specific function of the machine is outside history and human discourse. However, it is not outside the discourse of cassette tape itself. The perspective is thus shifted towards the medium itself as an operating entity (Ernst, "Towards a Media Archaeology"). Thus, a merger of object-oriented ontology and media archaeology presents itself, bringing an awareness to the moment when media themselves become active "archaeologists of knowledge" (Ernst, Media Archaeography 239). From a media archaeological point of view, it is only technical media that are able to register physical real signals. The cassette tape not only preserves the memory of human cultural language, but also the knowledge of how the cassette recorder stores and

operates the magnetic domains of the running tape and its ferrous coating. The "carpentry" of an artistic performative context exposes the knowledge that is embodied in the operational technology and reconfigures it into a philosophical practice; meaning that it exposes the saturation of the physical material and uncovers questions regarding our understanding of documented time. In addition, such perspectives reflect the use of our current digital technologies for documenting our sounding reality, by stressing the importance of paying attention to the media archaeological moment of the operational machine.

CASSETTE B – Is the digital revolution over?

Three decades after the introduction of the Mac computer in1984, the table is turning. According to a leaked NSA presentation it is now Apple who is Big Brother, and enthusiastic iPhone customers who are the zombies living in a surveillance state (Rosenbach et al). In other words, the promise of a digital revolution also implies a reaction where dominant actors remain faithful to the institutions of intellectual property, as Stuart Moulthrop predicted already in 1991. The computer, which was originally developed as a military technology but redefined as emancipatory and revolutionary by Apple and others, is now back again where it began: as a military intelligence technology.

Following Florian Cramer, post-digital critique can be seen as "a form of social networking that is not controlled or data-mined by those companies [Google, Apple, Amazon, and Facebook]." ("Post-digital Writing" 237) Paradoxically, these critical practices relate to a contemporary digital paradigm of controlled consumption by inquiring the poetics social constructions of lost technologies. Products such as Portastudio for iPad (Tascam), Tape (Focusrite) and Virtual Tape Machines (Slate Digital) all promise a shrink-wrapped sound and feel of classic tape machines within the convenience of favourite digital workstation. However, the fascination of the obsolete can also be of a different kind than the pure perceptual and digitally simulated aesthetics of the analogue. Contrary to Portastudio for iPad and similar products (which arguably fascinate), the material engagement with old technologies themselves originates in a different poetics and different ethics. The distinction between digital and analogue can also be understood as a distinction between shrink-wrapped and Do-It-Yourself, as Cramer further notes in his article in this journal volume (Cramer "What is 'Post-digital'?"). The fascination of vinyl records, floppy disks, and other historical and lost materials and platforms is in this sense a reaction to the ways cultural use is

packaged within hardware and software interfaces, and an exploration of alternatives.

CASSETTE A – Cassette types

Type I Ferric oxide. HF-ES90
Type II Chromium dioxide (CrO_2). CR-E II
Type III Ferro-chrome. FeCr90
Type IV Metal-formulated. Metal-ES60

CASSETTE B – A post-digital interface criticism

In a post-digital era of reaction (rather than revolution), the digital no longer seems to induce any disruption (Cramer "What is 'Post-digital'?"). When present digital technologies no longer afford the spaces 'in-between' that do not have clear ownership and are devoid of meaning (but are full of potential significance), past technologies appear as alternatives. However, if current materialist practices with bygone media aim to be more than a parenthesis in the reconfiguration of our interface culture (more than a trendy, hipster purely perceptual revival of the old which could just as well be subsumed in trendy new apps for the iPhone), they need to question their notion of material and materialism in a way that embraces a potential for criticism. Tampering with cassette tapes may not provide redemption of current interfaces and their culture, but may in the words of Benjamin present a 'weak Messianic power' (Thesis II).

Tape-out

From the perspective of the historical materialist, speculative realism appears as an all-encompassing metaphysics whose engagement with objects and materiality risks displacing their discursive, cultural and political contexts: how compact cassettes are embedded in linguistic and social constructs. From the perspective of the speculative realist, historical materialism risks not seeing the ontology and perspectives of objects – the essence in them. But how do the two theories relate to one another? There does not seem to be an easy answer to this, and no possibility to assemble a meta-theory. Following speculative realism: to capture their relations as objects, one can only access their appearance, and through practice (carpentry) explore the relations. Following historical materialism: such

explorations reveal allegories on the relations between culture and the materiality of media.

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