




## The Displaced *Dispositif*

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### Abstract

*“Dispositif”* is a term used in film studies since the 1970s to describe the entire system of mechanical and human factors which together bring about the cinema experience. It therefore refers to (amongst other things) the space of the auditorium, the screen, the projection technology and the physiology of the spectator. Many of its qualifying components are masked from the view of participants in the system. The *dispositif’s* purpose is to set up the conditions for a specific type of cognitive experience, one which mirrors and extends (and in some readings, controls) the experience of its participants.

The Displaced *Dispositif* is a performance designed for the space of a cinema theatre, but featuring the projection of fragments of early silent cinema on a coeval (1910s) film projector from the auditorium. The film fragments are live-scored by the sound artist, Shaun Lewin, using a combination of closely mic’d sources on the projector itself, luminance data from the projected image and EEG brainwave data recorded from participants during previous projections of the film. Displacing elements in the *dispositif* in this way, by shifting modalities, situating in parallel, feeding back and layering, draws attention to its hidden existence and creates the potential for a more knowing and informed participation in the cinema experience. It also serves to demonstrate the degree to which *dispositifs* of modern cinema spectatorship, which have morphed and proliferated since the widespread digitization of film heritage, have radically altered both the technological and experiential qualities of the medium. By integrating EEG data, the performance adds the dimension of electrophysiological experience to the long tradition within experimental cinema of artists calling attention to Cinema’s hidden structures. As well as challenging the dominance of the worldview propagated

by the film industry, the performance also signals a means of re-engaging with the creative potential of the system itself, once unshackled from its bonds to the reality effect and freed from the limits imposed by its commercializing instincts.

**Keywords:** early cinema; EEG; flicker; performance; sonification.

### *Qu'est-ce que c'est, dispositif?*

From a technological point of view, what we know of as Cinema is an agglomeration of many different technologies which achieved a certain critical mass in the dynamic interaction of social, economic and technological conditions available in the late 19<sup>th</sup> century (Punt, 2000). Since then, while retaining the name Cinema, albeit sometimes with qualifying epithets such as Silent or Classical, it has continued to accumulate additional features, most obviously perhaps those which appeal to the auditory as well as visual sense. The concept of sensory appeal itself points to the fact that this composite technological system would be nothing, or rather do nothing, without the human agents who have both designed it and queued up in their masses to experience it. This construction of Cinema, specifically, the projection of moving images, with or without sound, to an audience in the shared space of a theatre, can be contained by the term *dispositif*, first brought into use by the French theorist, Jean-Louis Baudry, in the early 1970s (Baudry, 1970, 1975, 1986). Although translated awkwardly as “apparatus” in some publications, it is now often used untranslated in English texts and has proved useful in defining a concept of the conditions of cinematic reception which can contain a wide variety of practices and experiences. It facilitates theoretical distinctions between one type of cinematic experience and another, and helps in parsing the contributions of the individual components while retaining awareness of a greater whole (Kessler, 2006). It also grants an equal place to those components such that, for example, the human subject of cinema is not lost to sight while considering the role of film technology, and vice versa, making it particularly valuable for interdisciplinary research. As a term, therefore, *dispositif* is valuable to interdisciplinary studies of cinema, describing a system of “surrogate” (Hochberg & Brooks, 1996) experience which includes darkness, a screen, projection equipment, a film, and human spectators and operators. Each of these features bears individual scrutiny and can be examined in much finer detail in terms of their role in the experience of cinema across time, a research process which, in turn, informs our understanding of film history.

One of the joys of studying early cinema is that the components of the *dispositif* are more obviously part of the experience. The subject/participant/spectator is more aware of them because less veils are drawn over the components of the system than in later forms of commercial cinema, which vigorously pursue the ever more virtually real. In contrast to the contemporaneous séance room or even the too-shapely leg of a

table, the pioneer of early cinema, projecting from amongst the audience, took a showman's delight in placing the technological component 'on stage,' a practice which effectively co-opted the auditorium into the performance space, certainly augmenting and perhaps even challenging the spectacle of the screen. By implication, therefore, the spectators were also drawn in to 'treading the boards' and would consequently be more aware of themselves as a component of the *dispositif*.

Within ten years or so of the first public cinema shows, the prosaic demands of fire safety regulations forced a significant change in the *dipositif* by enclosing the projector (and projectionist) in a metal box or bricking them up behind the walls of the projection booths in the first purpose-built cinemas (Enticknap, 2005). At the same time, the projection mechanism itself became more enclosed. For example, individual components such as the intermittent movement were encased in a cast metal oil bath and the external shutter moved closer to the lens and was lost to sight behind a protective housing. The noise of the film advance mechanism became overlaid with the hum of electric motors. This trend towards the black boxing of cinema's components ceded power to the screen and promoted greater immersion in the image. With the bolstering of the reality effect of the screen stimulus, the reflection of the spectators on their own agency would have decreased along with awareness of their presence in a system with potential for creative response and feedback.

Subsequent technological developments, such as the advent of synchronous sound, further rooted attention to the screen such that by the time of television's challenge to cinema's cultural hegemony in the 1950s, cinema's response and argument of differentiation was to expand the size of the screen and attempt to add a third dimension rather than to adopt an alternative strategy of revealing its true nature. This instead was the response of the avant-garde of experimental film makers, whose *dispositifs* of small halls, cafes and basements and portable 16mm projectors re-established something of early cinema's potential for a dynamic viewing environment, which would itself lead to developments termed expanded cinema in the 1960s and 1970s (Youngblood, 1970).

### **Is Cinema Also Digital?**

In the present day, what we know of as Cinema has undergone a momentous decade-long transition, shifting both means of capture and delivery from analog to digital technology, yet this has gone all but unnoticed by its mass audience. However, the gradual convergence of the technologies of cinema and electronic imaging, finally arriving around 2011 into the viewing *dispositif* under discussion here (that of the cinema theatre itself), has led to concerns from cinema's specialists (filmmakers, theorists, archivists and enthusiasts) that the basic structure of Cinema has been too substantially altered for it still to *be* Cinema (Rodowick, 2007). Undoubtedly, these concerns regarding Cinema's ontology have implications for the contemporary media landscape, but they are perhaps most pertinent to the question of how we now experience those films created in what we might retrospectively refer to as the analog era.

What degree of truth is there in the idea that a film made in, for example, 1910 would be gratuitously misrepresented by presentation via a 2010 digital projector, despite the fact that the digital copy (digitization) may be of the best type with no apparent difference in image quality, as would follow with current film restoration practice? Would the different temporal resolution of analog projection (actually theoretically inferior) make a difference not just to an entrained aesthetic experience, but also at a more basic perceptual level? Does the removal of mechanical film technology and the splicing in of video technology affect the other constituent parts of the *dispositif*, especially the physiological response and consequent perceptual and cognitive experience of the human subject? In order to work through some of these concerns, and in collaboration with neuroscientist colleagues Stephen Hall and Edward Rhodes, we collected some data on brain activity (specifically area V1 of the visual cortex) of various volunteers while watching projections of early cinema content. A ten-minute reel of four different clips (representing different genres of film) was presented across two different conditions, the first projected by a 1910s hand-cranked film projector and the second, a 2010s High Definition video projector, typical of the sort used to present archival film in modern exhibition contexts (Edmonds, 2016).

EEG recordings from three sensors in area V1 were taken along with luminance data from the projection screen which determined the flicker rate of each of the projectors: a variable 14–16hz for the hand-cranked projector with a single-blade shutter and 120hz for the video projector with a single Digital Mirror Device chip and a six-blade color wheel. Would the intrinsic brain rhythms of the participants be affected or driven by the similar frequencies of the film projector? What effect would the 120hz stimulus of the video projector create? Could the low frequencies of the film projector create a Steady State Visually Evoked Potential (SSVEP; Herrmann, 2001) which would effectively synchronize the basic perception of the spectator with the technology? Such a link at the level of technology as opposed to higher level cognitive interaction with the image content would suggest a basic framework to the early cinema *dispositif* which is not accommodated by the technically highly accomplished digital projection.

Observations made while collecting the data included the perhaps obvious realization that the projected film image is of much greater complexity than the simple black and white stimuli normally used in psychophysical experiments, which would be more likely to produce an SSVEP. Flicker is much more consciously perceptible in large bright areas of the image than in dark areas, although interestingly both the visual cortex (from the V1 EEG recording) and the photometer picked up the modulated light in the entirely black sequences of the film which linked the clips together, despite this being invisible to the evidently not so ‘naked eye’ of the experimenters.

### **Doing for the Ear What the Cinematograph Does for the Eye (and Brain)**

Out of necessity, the testing was conducted in a lab in which the non-portable EEG recording device was installed, although ideally it would have taken place in the space of a cinema theatre. Once recorded, however, the data was far more portable and it seemed fitting to take this record of cinema experience and 'return' it to the *dispositif* of the cinema. The question of how to present such data was suggested by another known absence: nearly all the original participants had commented on the sound of the film projector, such that it seemed to be a very significant, yet unrecorded part of the test. By combining a sonification of the existing EEG data with the sound of the projector mechanism, key elements of the *dispositif* could be drawn together and viscerally unified. The data of both the electrical activity of the brain and the screen luminance were sampled at a rate of 2048hz, thus giving a very fine temporal grid against which to isolate brainwaves and light modulation operating at much lower levels. Interestingly though, the ear can discern much higher levels of auditory flicker, "above 1000 interruptions per second" (Miller, 1947), so how better to recast the data than in an ear-readable form? What can the ear tell us that the eye has missed?

A rationale for the sonification of the data was worked out collaboratively between Guy Edmonds and the sound artist, Shaun Lewin. The aim was to incorporate it with the hand-cranked projection of the film used during data collection and present it as a live performance which should afford an individually subjective interpretation of the data alongside other sonic, mechanical and visual elements of the *dispositif*—a *modus operandi* which allowed for a certain amount of processing to be applied to the raw data, as detailed in the following description.

A Max/MSP patch was used to ratchet the sound of the projector's shutter mechanism to the light-modulated sonification of EEG recordings of 10 spectators, in a system analogous to the tined drum found in player pianos. Each shutter event triggered the playback of 1 frame's duration of EEG data (defined as 62ms, equivalent to 136 data points within the EEG recordings); these values were determined as an average 15 frames per second and derived from the results of the luminance data from the slightly variable-rate projections presented to the 10 subjects. Initial explorations in the sonification of the EEG recordings revealed that the simple transduction of a floating-point data stream into 44.1KHz digital audio produced a sound work that would place substantial demands upon an audience seated for the full duration of the film. Experimentation revealed that adding a second instance of the transduced EEG audio to itself with a very short interval of time separating these instances created a resonant tone with some harmonic characteristics (a process often described as comb filtering). In order to differentiate between the 10 subjects' neural activity, a different interval of time was applied to each EEG data stream's comb filtering; these intervals were determined through exploration of the emergent sound work and do not have a semiotic value

beyond that of an arbitrary index of identities. The intensity of each comb filter is proportional to the quantity of darkness captured by a webcam facing the projector screen, in a negative emulation of the use of a photometer in the original test.

The production of multiple resonant tones with pronounced harmonic and inharmonic components, the complex syncopation of the EEG data streams and the role of the audio within a larger multimedia piece all suggested a relationship with the use of a gamelan orchestra within Indonesian shadow puppet theatre events. This relationship was rendered explicit through the use of audio processing that translates the frequencies produced by the comb filtering into their nearest equivalent within the 7 note Pelog scale (tuned to concert pitch).

The first performance of this Displaced *Dispositif* was given on August 17, 2017 during the Off the Lip colloquium (See Figure 1). Although not scientifically readable and technically needing further development, the performance succeeded in establishing a symbolic link to the operation of brainwaves within the *dispositif*, such that those present may well have questioned their role as the *eleventh* spectator.



**Figure 1.** Guy Edmonds and Sean Lewin set up the equipment used for the performance of “The Displaced *Dispositif*.”

The transferability of *dispositif* is the key to its usefulness as a concept. We can talk of *dispositifs* of early cinema, of amateur cinema, classical Hollywood cinema, avant-garde cinema and indeed digital cinema, and we know we are talking about the specific viewing conditions of a specific type of cinema, all of which differ from each other (Parente & de Carvalho, 2008). For film archives and museums, this ‘film as *dispositif*’ (Fossati, 2009) concept plays a significant role in modern collection policy, which accepts the impossibility of replicating any one historical film moment in all its complexity and instead offers new *dispositifs* for old films by, for example, self-consciously commissioning new scores for silent films. This is already one level of displacement that our title alludes to; however, with this performance we aim to displace elements within the *dispositif* into other modalities, to make them apparent and call them more powerfully into our conscious experience. Rather than a new score then, this performance invites the audience to listen to that most silent of film accompaniments—the brain activity of the spectator—while hopefully bringing its relation to the rhythmic propulsion of the film strip further into the realm of conscious perception. Notwithstanding the fact that every screening is to some extent a displacement of all previous ones, the performance takes a step further in displacing some of the contents of cinema’s black boxes and making the hidden dimensions of the cinema experience more apparent, revealing the potential for ‘liveness’ in what might otherwise be taken for a uniform product. The show must go on!

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### First response to “The Displaced *Dispositif*” by Jacqui Knight

In Edmonds’ performance, we are offered a unified experience of both EEG experiment and results that reveal something about the nature of neurophysiological experiments whilst simultaneously exposing hidden elements of the filmic dispositif—the brain activity of the spectator. Using an analogue projector, the flicker, winding noise of the apparatus and the performative presence of the projectionist all typically keep a spectator aware of the production of the filmic illusion. However, Edmonds’ performance work further reveals some of the hidden contents of the black box, the component parts of the system which allow him to manipulate the hierarchies in the filmic *dispositif*. Understanding less the specific role of each determinant in the *dispositif* but more the relationships between the film, the darkness, the viewers experience, the apparatus, the projectionist and so on shows the infinite potential of each cinematic experience to unfold differently each time.

The importance of Edmonds’ work lies in the transferability of this method, useful in an archival capacity to think about the network of technologies concerning the process of duplication, and in a curatorial capacity to expose new narratives and provoke alternative readings of particular film works. In addition, from a filmmakers’ perspective, this method could be used as a device in the creation of new film work. This would follow the Structural Materialist filmmaking philosophies from the 1960s and 70s that attempted to demystify the film process, an antidote to the highly ideological mainstream narrative cinema. You could say Structural Materialists’ films explicitly pointed to different aspects of the *dispositif* through using anti-illusive techniques. Your investigation follows and extends these Brechtian traditions, keeping us actively aware of the construction of the cinematic reality but also aware of the emergent, infinite dynamics and relationships between all the determinants of the *dispositif* system. This work then perhaps offers a “New Structural Materialist” approach, drawing to attention other materialisms such as electrophysiological experiences that were certainly not available during this experimental film movement in the 1960s and 70s.

In Edmonds’ performance I question whether the sonification of EEG brainwave data and luminance data can actually mirror or give us any empirical information about its participants’ cognitive experience, since this interpreted data is already a representation. To make a further reinterpretation of this data (through this performance) is producing something that would probably have no correlation to its source. I suspect this is not the purpose of this performance anyway, and in fact we are offered something more akin to an experimental visualization of this data which questions new ways to understand the cinematic experience, other than those experiences directly articulated to us using our sensory apparatus.

From a performative point of view, I would be interested to see a live sound score taken directly from EEG data of a spectator in situ. The film spectator being part of a more authentic *dispositif* system—within the cinema—which would not isolate the subject from the audience and the cinema context.

## Second response to “The Displaced *Dispositif*” by Mark-Paul Meyer

The live performance at OTLip17 on August 17, 2017, was a memorable one. Edmonds and Lewin projected a 35mm film with a hand-cranked projector, accompanied with a sonification of the EEG frequency recordings of persons who had watched the films in a laboratory setting. This performance was highly experimental and not as perfect as Edmonds and Lewin had wished, but overall it was an experience that raised enthusiasm and relevant issues for debate. Concerns about the synchronicity between film and sound were foregrounded during the performance, but for most attendees the performance was an intriguing experience, in particular from the perspective of making visible (and audible) the hidden structures of the cinema *dispositif*.

However, this also raised the question of what we were actually listening to. The sonification of 10 EEG recordings resulted in a noise with little tonal variation and little clearly distinguishable punctuation. The question is whether other strategies of sonification would have had better results. Sonification of data is already a well-developed practice in different domains of scientific research and it seems that much can be learned from these experiences in other disciplines. Without being familiar with these developments it seems that there must be a way to make a sonification that is not only more pleasurable to the ear, but that is also more informative about what is exactly happening in the human brain while watching films.

Since Guy Edmonds’ research project is also about the difference between analog and digital projection, there is also a question of whether the sonification of comparable data from a spectator watching a digital projection would result in a noticeable difference. If the claim is right that, for instance, the memory of the spectator is activated differently when watching an analog or digital film, this could partly be supported by a difference in data and a hearable difference in sonification.

This brings me to the title of the paper that Guy Edmonds presented—the ‘displaced’ *dispositif*, which refers to displacing elements in the *dispositif*—and one could ask whether the activity of the human brain should not be considered an inherent part of the *dispositif* as it is hidden, invisible, almost immeasurable, but nonetheless a crucial part of it. Edmonds does not elaborate much on the term ‘displaced,’ but I would argue for an ‘expanded’ *dispositif*, since the cornerstones of the *dispositif* are known and well defined, but a lot can still be said about these cornerstones. If we can disassemble a film projector into its many constituent parts and units to understand its working, we may also be able to “disassemble” the mechanism of human perception and integrate that in the concept of the *dispositif*.

As an archivist, I like to raise the question of whether this expanded *dispositif* can/should be used as a parameter in the restoration, preservation and presentation strategies of historical cinema. In particular with regard to films from the silent era,

but also from the later years of analogue cinema. In the digital era resolution, bit depth, color space and so forth are important considerations which have been identified as being critical to accurately reproducing an analog image in a digital format. This is understandable since visual quality is dominant in all discussions on reproduction of film images. But this paper suggests that invisible properties should also be considered. Differences in frequency between the analog and digital apparatuses—either the cinema machines or the apparatus of human perception—have never been discussed and this paper implicitly poses the question of whether these frequencies should be considered as part of the restoration, preservation and presentation of archival films. Does “authentic perception” of an analogue film exist and is it relevant and possible to recreate or remediate this authentic perception with new digital technologies? It seems that sonification could be an innovative strategy to give a partial answer to this question.

### Third response to “The Displaced *Dispositif*” by Aska Sakuta

While watching the film, I felt a strong emotional response, which consisted of three experiential levels (or layers?), each relating to different elements of the experience: the content of the film, the visual quality of the film, and the presence of the conductor (I suppose the proper term is projectionist) of the film.

At the first level, I could see that the film was recorded a long time ago; the sites and people in it seemed to be from previous eras. This made me ponder—as such things usually do—what it would have been like to see, feel, and experience those things then and there.

At the second level, I could also see that the film was in “black and white,” shown on a small area of the screen, flickering, and sped up; all of these qualities are different from what we would normally encounter today in a modern movie theatre—all in all, much less “accessible” in terms of one’s ability to experience what is happening in the film as if one were there. This “inaccessibility” somehow increased my desire to connect to the content of the film (a desire that had already existed at the first level). It was almost as if I was naturally led to place more effort into achieving that goal, once difficulties appeared in its path. This strong connection (or desire to connect) to the sites and people in the film then led to a piercing realization that these things no longer exist (people have passed, sites have changed...); or, in other words, I can *never* experience these happenings as they had happened in real life. This realization induced a sinking feeling of loss, or perhaps longing. The aforementioned “inaccessibility” of the content of the film seemed to reinforce that realization (“I can never experience this”) even further.

Finally, at the third level, I was made hyper-aware of the effort that was put into the presentation of that film—a feeling that one rarely experiences in modern-day film screenings; as the author has mentioned in the paper, the work that lies behind showing a film is usually “hidden.” The audience does not even know whether anything is manually operated—for all we know, everything could be completely automatized. However, in this screening, I could see the projectionist and hear the projector; the “work” is exposed. I could see him operating the machine, from beginning to end, never stopping, working with careful precision. I often enjoy such transparencies in live theatre productions (performers, stage managers, lighting and sound technicians, all working together to make the show happen), but for me to encounter this feeling during a film viewing was a novel experience. Nonetheless, my emotional response towards this particular awareness was just the same as that of a theatre performance: deep gratitude and appreciation for the fact that so much work was put into realizing this experience.

The three emotions (curiosity and wonder towards another world, the attachment, loss and longing towards that unknown world, and the appreciation towards the work of “bringing that world back to the present”) accumulated into an overflow of emotions, which resulted in tears.

I would say that the levels were all present by the end of the experience, but appeared in the order that I mention, one layer over another (which is why I debated between using the word “level” or “layer”). Interestingly, however, in live theatre performances, the last level (appreciation towards the “work”) would normally appear before anything else. My guess is that this is because that level is more viscerally (as opposed to cognitively) grounded than the others, as it is caused by an explicit, real-life exposure to the “workers” in the space—a type of presence that reaches me without the need for conscious interpretation (seeing the performer, hearing an orchestra, seeing the spotlight move across the stage with the actor, etc.). Whereas, the first level (curiosity towards content) takes a more interpretive attitude to access (knowing the intention behind the performance, understanding the aesthetic and contextual value of the work, etc.), and the second level (enhanced attachment towards content due to its “inaccessibility”) is almost completely dependent on whether the first level even exists; were I to be uninterested in the content to begin with, its “inaccessibility” would just surface as a mild frustration. In reference to speed, I suppose I could say that the more “visceral” response (i.e., third level) would reach me faster than the “cognitive,” but it is interesting that it did not happen in that order during this presentation. It may have something to do with my expectation (or ingrained understanding) towards film screenings; that I am to focus on what is on the screen rather than who is doing the screening. It was not until later that I became aware of the fact that this is in fact also a “performance,” and that a person, right here, right now, is putting work into it.