Boxes and the Work of Articulation

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So let's just get this out in the open: there is no way to abstract the study of signal processing from its cultural articulations that doesn't irreparably compromise research.

I've come to this conclusion as result of what I thought was a simple question: how do you connect old video game consoles to today's screens? This process has proved to be anything but straightforward. And, along the way, it's raised some basic questions for me about the theory and practice of media archaeology in the tradition of the "Berlin-Humboldt" school in general, and in the work of Wolfgang Ernst in particular.

If you look at images of media archaeology labs like the Media Archaeological Fundus at Humboldt University in Berlin and its growing number of imitators, what you'll see are shelves of computers and other kinds of technological devices — boxes. These are not the "boxes" that I'm going to talk about today. I'd like to consider what's missing from these pictures: external packaging and ephemera on one hand (down to and including the presence of various kinds of tape on the boxes) and the wires and devices that facilitate the connection of legacy computer equipment to contemporary screens on the other . My contention is that the physical space of the fundus model of a media lab, dominated by long arrays of bare equipment, obfuscates the always-present articulation of material technology to discourse, bodies, institutions and other forms of cultural context.

Media archaeology emerges as a necessary and explicit (Ernst 25, 114) historical corrective to what Ernst calls "the cultural studies approach." His particular concern is with

work that brackets an analysis of the material aspects of technology in order to focus on the political economy that surrounded the technology, the semiotics of its advertising, and its function in everyday life (much as I admire it, this is a significant shortcoming of the 1997 classic *Doing Cultural Studies: The Story of the Sony Walkman*) . Following Friedrich Kittler's lead, Ernst asserted the importance of a non-metaphorical encounter with material media, focusing on how electromechanical media process, store and retrieve signals. Both Kittler and Ernst make extensive use of the Shannon-Weaver mathematical model of communication, which, given their interest in signal processing as a key element of posthumanist media studies, makes a certain kind of sense. The problem is that what began as a theoretical corrective has become a serious limitation of media-archaeological theory and method.

I'm not the first to note this. In his editorial preface to Ernst's work, Jussi Parikka goes to great lengths to critique it for its bracketing of the cultural (10). Parikka goes on, though, to argue that the redemptive value of this risky gesture lies in Ernst's arguments about temporality. Ernst generalizes Kittler's thesis about how phonography re-produces the Real of a recording to all media, arguing that the replay of both analog and digital signals creates a temporal "short circuit" (13, 57, 98, 145, 199) that literally re-produces lived experience.

As Parikka observes, Ernst has "a methodological preference for rejecting the projection of generalized theories in favor of precise case studies" (44). It's out of just such a precise case study of signal processing that I have come to the opposite conclusion. So let's start with an account of early video game signal processing and see where it takes us.

Cathode Ray Tube (CRT) televisions of the 70s and 80s output a "full" picture of 480 interlaced lines, or 480i ("interlaced" means that the TV drew all the odd-numbered lines, then began

again with the even ones). CRTs display interlaced content at 30 frames per second (fps). The earliest home video consoles lacked the power to output at 480i and required a faster 60 fps frame rate to create the illusion of motion. So what these old consoles do is draw half of a "full" 480-line picture and display it at the normal 60 fps rate as a "non-interlaced" picture. This is called a 240p (for "progressive scan") analog signal.

There are a variety of standards for delivering that signal to a screen, and they differ substantially in quality. The lowest-quality and oldest of these standards is RF (radio frequency) , which delivers all audio and video information in a single channel. Composite video carries the audio and video signals on separate channels, but is not much of an improvement because all of the video information is still encoded on a single channel. Quality jumps drastically with S-Video , which separates luminance and synchronization information (luma) from colour information (chroma) into two pairs of channels. Component video (or Y-PB-PR) , which has a higher colour resolution than S-video, has three channels — Y carries luminance and synchronization; PB is the difference between blue and the luma, and PR is the difference between red and luma (the green information is derived mathematically from the other signals). Composite standards like VGA , EuroSCART and JP-21 are still more complex. They use various configurations of wires and plugs to deliver red, green and blue signals through separate channels … and include additional information about how to synchronize those signals on the screen. Unlike S-Video, VGA and Component, EuroSCART and JP-21 can also carry audio information.

Today's flatscreens still have many of these ports attached to them as a form of residual media, though they are rapidly disappearing from newer TVs . These TVs mostly use HDMI cables (which carry all of the information that SCART and JP-21 do, plus DRM capability), but the crucial detail to remember is

that flatscreens are digital. Any analog video signals that they display must be transcoded to digital and blown up to fit their larger screens and higher resolutions.

Because of differences in signal processing speed, plugging an old console into a new flatscreen sometimes results in no picture at all because the TV won't handle low resolutions, or it mistakes progressive signals for interlaced ones. But many flatscreens now have their own built-in upscalers. Sometimes the result is some form of incorrect processing (such as flashing images or "combed" images). Often this introduces a lag between pressing a control and action onscreen, which can render many games unplayable. But even when the lag is acceptable and the HDTV actually produces a smooth, soft image, this is where cultural articulation comes in, and an analysis concerned solely with signal processing on a technical level falters, because that smooth image is precisely not what many of the people interested in old video game hardware want to see.

What they want is pure simulacra: an image with the perfectly sharp square-edged pixels of digital emulators rather than the soft blurriness of CRT images, and also, in many cases, artificially created scan lines that evoke a late 70s/early 80s CRT but would never appear on a flatscreen, which has no electron gun.

As I said, I want to talk about boxes and cables. What produces this purely contemporary simulacra is a Frankensteinian assemblage of modified and unmodified legacy game consoles , custom-made cables capable of carrying RGB signals (most of which come from one of only two cottage-industry-level producers, one in the USA and the other in the UK) , one or more upscalers , line doublers , sync processors , switch boxes and scanline generators (again, many of which have sole sources in Japan, Turkey or Germany, or have boards designed by Australians or Americans which are then produced in China, shipped to their designers then and hand-assembled

in someone's basement), slightly obsolete high-end prosumer video hardware , sunsetted enterprise-grade video processing boxes that cost thousands when new and can be had for around $100 on ebay , scavenged broadcast video CRT monitors , professional quality analog RGB flatscreens , and other improbable devices.

Instead, there is something new and historically specific: a dense thicket of software, hardware, cultural practices, "expert" discourse (in Carolyn Marvin's sense), ideologies, beliefs, aesthetics and interpretive communities, brought into being by a longing for a fantastic object that never actually existed. It all points to the unbridgeable chasm between historical moments. The onscreen symbolic content may appear similar enough that we call it "retro," but because its meaning is produced by its relations to other objects in culture, and because the articulations between those objects have changed, the meaning of the object has also changed. The past that the media archaeologist strives to activate via temporal relay is always different from the actual past, despite Ernst's assertions otherwise. There is no short-circuit time travel in media archaeology, only the creation of endless echoing feedback loops.

What media labs do is what Stuart Hall called articulation, that is, the linking of disparate elements together to create a temporary unity. There's nothing necessary, determined or correct about these unities. They are historically, materially and geographically specific. The individual components have been utilized in other articulations in different ways, and no doubt will be again. This is where the McLuhanesque idea of technological supplementation becomes important. Using old media provides a surfeit of detail that we could not and did not remember by ourselves. Sometimes they trigger memories, but they also create memories wholesale where none existed before.

Both media archaeology and platform studies need a re-

encounter with British cultural studies, particularly with James Carey's ritual theory of communication and Hall's notion of articulation. The assemblages that we create in media labs are always busily channeling ideology as well as current. Our methods and theories need to be robust enough that they can account for both the technical and social aspects of this process.

The beginnings of such a recalibration are already in evidence in publications such as the Cultural Techniques issue of *Theory Culture & Society* that appeared in November 2013 (30.6), but the strength and currency of the media-archaeological paradigm means that it's important to work to continue this rebalancing. If we take seriously Lisa Gitelman's contention that the basic definition of media is the combination of material technology plus social protocols, much of the information about those protocols, including how they have changed over time, comes from things like video game boxes. To ignore them is to risk serious anachronisms and other forms of gaps in analytical thinking.