

Record/Film/Book/ Interactive TV: EVR as a Threshold Format

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Abstract

Although home video scholars often position the EVR (CBS's Electronic Video Recording) as a failure, I argue that it is best understood as a *threshold format* that articulated new possibilities for television by linking it to existing but divergent technologies and practices: the phonograph, film cartridges, print, and interactivity. As developed through original document research built from the Motorola archives, newspapers, biographies, promotional materials, and a range of trade journals, I show how the EVR contributed to ongoing negotiations over the meaning of television and demonstrate the value of threshold format as an analytic lens attuned to formats that boast little or no material existence but which occupy pivotal positions within ongoing experiments into how “old” technologies can be refigured to offer new possibilities and opportunities. Whereas successfully standardized formats tend to obscure the possibilities that came before them, attending to threshold formats redirects our attention to forgotten ambitions and potentials.

Keywords

Electronic Video Recording (EVR), failure, video, useful media, new media history, history of technology, format theory

Designed by President of CBS Laboratories Peter Goldmark in 1960 as “a visual counterpart of sound reproduction from a long-playing record,” the EVR (Electronic Video Recording) used a cartridge to play sound and image embedded on a thin strip of film on “any home television set” (*CBS Electronic Video Recording* c1970; Goldmark

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1970, 22).¹ Or, it was supposed to. After eleven years of lurching development, two CBS funding rejections, the dissolution of four potential funding and manufacturing partnerships, a cartridge duplication plant beset with mechanical and staffing difficulties, two years of release date push-backs, and only eleven months on the market, CBS abandoned the EVR and its stake in the rapidly intensifying race to invent a small-format video player for home and institutional use in 1971. Promised longer than it was produced, the EVR had the staying power of a corpse flower bloom.

Despite the EVR's premature obsolescence, it offers valuable insight into the utility of what Jonathan Sterne terms *format theory*—his call to “focus on the stuff beneath, beyond, and behind the boxes our media come in” and “ask after the changing formations of media, the contexts of their reception, the conjunctures that shaped their sensual characteristics, and the institutional politics in which they were enmeshed” (Sterne 2012, 11). As Sterne suggests, “if they have enough depth, breadth and reach, some formats may offer completely different inroads into media history and may well show us subterranean connections among media that we previously thought separate” (Sterne 2012, 17). I argue that the EVR is one such format.

Most significantly, the EVR demonstrates the importance of examining what I call *threshold formats*: those formats that never reached saturation or even standardization but which occupy pivotal positions within (material and discursive) experiments into how “old” technologies can be refigured to offer new possibilities and opportunities. Drawing from original document research built from the Motorola archives, newspapers, biographies, EVR promotional materials, and a wide range of trade journals in the fields of electronics, engineering, industrial media production, education, medicine, computing, and journalism, I show how, as a threshold format, the EVR contributed to negotiations over the meaning of television by linking it to existing but divergent technologies and practices: the phonograph, film cartridges, print, and interactivity.

For the purposes of this article, I consider a format to be a particular technological iteration of a medium described both by its material form and the protocols by which it operates, with “protocols” referring to the “vast clutter of normative rules and default conditions” that shape the operation of a technology and, in doing so, “express a huge variety of social, economic, and material relationships” (Gitelman 2006, 7; Sterne 2012, 8). Via their protocols and material form, formats preserve social relations and organize new ones. PDFs, for example, maintained printed documents' distinctions between author and reader by prohibiting textual alteration while simultaneously shifting office paperwork responsibilities (reproduction and distribution) from clerical workers to document producers (Gitelman 2014, 117, 127, 130). Furthermore, and as we will see in the case of the EVR, in their difference and multitude prior to standardization, formats attest to the contingent relationships between media form (telephony) and technology (telephone). Whereas successfully standardized formats tend to obscure the possibilities that came before them, attending to threshold formats redirects our attention to forgotten ambitions and potentials.

Like the thin sill of a doorway, *threshold* formats are connective (between old/now/new), and they are passed over quickly in the movement from one set of technological possibilities (and different social, cultural, political, and economic arrangements) to

another. Although we might hesitate in a doorway, we do not dwell there. Furthermore, thresholds boast scant physical existence, gesturing more toward possibility than materiality; forever occupying the status of “just-about-to-be-ness,” threshold formats also contribute to discourses surrounding permanently promised, never realized technologies that powerfully shape cultural understandings of possible (and desired) futures. Threshold formats are both transitory and transitional. Thinking through threshold formats in this way activates concerns in social construction of technology (SCOT) and new media studies regarding the complexities of technological emergence and persistence.

Transitory formats guide researcher attention to short-lived, low visibility, and easily forgotten formats that may live most—or all—of their lives exclusively in a “paper world” where their material reality is confined to the prognostications and publications of (potential) users (Latour 1987, 253). Transitory formats never reach dominance, moving instead from a period of emergence to residuality. Although they may continue to manifest as “an effective element of the present” open for oppositional appropriation (Williams 1977, 122), these opportunities are limited by the emergent reach of a given format; the intensely short-lived EVR, for example, entertains little hope for such resurrection. Persisting, when at all, in scattered traces and stubborn residue, transitional formats demand we ask after the flickering lifespan of newness, the exigencies of forgetting, and the methodological difficulties and utility of renewing these disappearing acts.

Understanding a format as *transitional* means pushing beyond the acknowledgment that technologies are always in transition to determine *how* new technologies make their newness legible at the same time they build continuities with older technologies. Scholarly attention to change has charted transitional logics via complementary and occasionally overlapping media “cycles” defined by the diffusion of innovations within a social system (Rogers 2003), shifting understandings and uses of particular media as they move through different cultural strata (Williams 1977), the transformation of media systems from open to closed (Wu 2010), and technologies’ passage through a series of phases from invention and innovation to regulation and mainstreaming (Peters 2009). The threshold lens elongates moments toward the beginning or even prior to the start of these cycles when a format’s status as “new” is still in flux. As the newness of a medium is not automatic, but socially and culturally established through comparisons with existing media (Sterne 2007, 18), focusing on these moments provides an opportunity to trace the continuities just as much as the ruptures that enable “new” to emerge from “old plus” (Peters 2009, 18). The terminology of transitional also builds on notions of “interpretive flexibility” to emphasize the mobility of threshold formats as they become appropriated by different user groups embedded within different spaces and acknowledge the varying levels of access and intervening power held by a range of intermediaries for a technology that permanently resists “closure” (Pinch and Bijker 1984).

In the case of the EVR, convergent thinking defines this particular moment as varied groups experimented with the EVR’s capabilities as a multi-function appendage to the home set while working to establish the EVR’s newness through its difference from “television.” Although remediation is certainly a characteristic of this process of becoming

new while acknowledging previous forms, the broad sweep of remediation—“all mediation” (Bolter and Grusin 2000, 55)—dulls the concept’s usefulness. As a subset of remediation (Canavilhas 2012, 9), convergence is far more useful for tracing continuities amid newness due to its emphasis on hybridity and its processorial nature (Jenkins 2006). Dreams of multiply hybrid television—in terms of its technology, economics, social and cultural practices, regulation, and texts—structured discourses both promoting and domesticating the novelty of the EVR; hybridity provides the tension that throws “now/old” technologies in relief *and* makes newness legible. This emphasis on continuity as a key principle of newness works against what Charles Acland (2007, xix) calls “the reigning myth of new media,” which obscures varied technological temporalities and historical experience in its focus on the radically disruptive potential of the new.

Given the EVR’s inability to achieve standardization, this study is sympathetic to work on “failures and false starts” that has invigorated our histories by turning attention to understudied and wholly forgotten machines, practices, and user groups (Douglas 2010, 294). Estimates put the final tally of EVR cassettes produced in the hundreds—an impressive inadequacy for a system that “in essence” was developed for “the production of copies in reasonable or large quantities” (Lardner 1987, 78; McLean and Rogers 1971, 249). However, leaning too much on the language of failure given the EVR’s inability to manifest machines or money obscures its productivity in other cultural and ideological spheres and reinforces a conventional success/failure binary. This critical stance toward “failure,” taken up fruitfully in SCOT and new media studies, reveals new understandings about the processes by which technologies come to be meaningful, works against historical progress tropes, and showcases how attending to failed technologies’ “inseparable relations to surviving systems” elucidates the power embedded in persisting forms (Gitelman and Pingree 2003). Research has shown how failure—like success—is the highly contingent result of struggles among varied actors negotiating complex social, economic, material, ideological, and political conditions (Lipartito 2003, 54–58) and how negotiations over and discourses surrounding failed technologies close avenues of investigation and exert pressure on ongoing processes of technological development (Lipartito 2003; McCray 2001, 291). Failure thus opens new avenues of research into the margins of media history while deepening our understanding of history at the center. *Threshold formats* allows us to follow this trajectory set out by scholars of failure while firmly insisting on the unique productivity of transitory and transitional formats.

Although Goldmark began development of the EVR in 1960, it was only in 1967 that CBS intimated serious plans to market the machine to the public with the formation of the EVR partnership, an international consortium that included British chemistry powerhouse Imperial Chemical Industries, Swiss pharmaceutical firm CIBA, and their shared subsidiary Ilford Ltd., which made a silver halide film suited to EVR cartridges. Motorola signed on as the exclusive U.S. manufacturer of the machine in 1968 and after a host of difficulties and two years of delays, the EVR was made selectively available to industrial and educational users in February 1971 for \$795 (roughly \$4,675 in 2014), a cost almost three times CBS’s early estimates (*Business Screen* 1967a).² That December, following heavy losses for the year, CBS announced it would

be pulling out of the partnership and relinquishing all stakes in the EVR with the exception of patent royalties and limited content production (*The Wall Street Journal* 1971). Although Motorola pursued its stake in the machine and its software through 1972 and the EVR partnership managed the manufacture and distribution of the device for several more years, particularly in Europe and Japan, CBS's withdraw signaled death for the EVR as a viable international format.

As the first video player to market, the EVR traded on a host of affordances articulated to the potential of video players—watching on the home set, collecting and exchanging media commodities, and the programmability of television. While others used tape, lasers, and holograms, the EVR cartridge contained a 750-foot spool of miniaturized 8.75-millimeter black and white film split down the middle into two separate tracks. In color cartridges, one track held the black and white image while the second held information that translated the monochrome image to color, leading to a run time of twenty-five minutes. For black and white cartridges, both tracks could be used for content, resulting in a fifty-minute run time. Although its film base meant that it had no recording capabilities, it provided the EVR with two unique features. First, each of the 180,000 frames per reel could be programmed independently with still images or text, giving the EVR an unparalleled storage capacity for non-moving image content. Second, the dual tracks of the EVR film could be programmed together, and users could switch between the two as desired, allowing for rudimentary interactivity. These capabilities have been routinely ignored by histories of home video interested only in the affordances of the victors, yet they are central to understanding continuities in the EVR's emergence.

The following sections are arranged to highlight four major avenues of development open to television amid discussions of the potential of the EVR. To emphasize the value of *threshold formats*, each section traces the material forms and protocols that mark the EVR's continuities with a given technology, setting these in relation to divergences resulting from the combination of these “not yet televisual” affordances and practices with television as it was popularly constructed between 1960 and 1972. Given media and video studies' emphasis on entertainment, only one of these paths—the use of the EVR in the home as a corollary to the long-playing record (LP)—has been treated with serious scholarly attention. Even then, the EVR and its early small-format video cartridge brethren function narratively as mere foreshadowing for the successful penetration of video cassettes in the home (Lardner 1987; Newman 2014; Wasser 2002). In contrast, tracing the EVR's properties as a threshold format replete with its own particular meanings and possibilities—rather than a failed version of something that persisted longer—reveals a diversity of ideas and practices articulated to television that become overshadowed by such teleological historiographies.

EVR as a Phonograph

The most readily available technology used to domesticate the newness of the EVR was the LP. Suggested by Goldmark, CBS, and Motorola in promotional materials, the construction of the EVR as a “video phonograph” is also taken up in early popular and

trade press. In addition to describing the system's form and basic mechanics—a thin, disc-shaped cartridge pierced in the middle that slips onto a spindle for playback—correspondences drawn between records and EVR cartridges invoked notions of on-demand programming curated by the individual viewer, media commodity collecting, and user friendliness (*Business Screen* 1969a; Galton 1970; Goldmark 1970, 22; Gould 1968, 1970a; Rohrbach 1967; C. Smith 1970; *Time* 1970; MSLAC–Promotional and Advertising Materials [MSLAC-PA]).³ Not coincidentally, the invention of the LP was one of Goldmark's signal achievements during his tenure with CBS; the association of the EVR with a technology that already won a costly format war enabled CBS to make implicit claims about its power to win standardization for its products. The most significant implications of the convergence between the EVR and phonograph, however, emerged from how the association imagined the EVR's ideal users: home audiences.

One of the primary groups to exploit this relationship was an assemblage of cultural critics who acted as powerful intermediaries in shaping the meaning of early video technologies in the home (Dawson 2007). Rallying against what they perceived as the “TV problem”—low-quality content harming children, numbing adults, and ruining tastes—critics for outlets such as the *New York Times* and the *Saturday Review* hailed home video as a solution to broadcast television's “vast wasteland” (Dawson 2007, 526, 531, 542). By emphasizing users' abilities to make software choices that shored up middle and upper class tastes, critics suggested that video could improve television's (and broadcasting's) programming shortcomings—insofar as they were understood by self-styled cultural authorities and “elite” consumers (Dawson 2007, 524, 526). Promotional and trade publications pursued a wider range of potential home uses and users. In particular, “home study”—as direct skilling (teaching a child to read, cooking with Julia Child, bettering a golf swing, and employee training)—invoked enterprising women and workers as significant users of the machine (Brockway 1971; *Business Screen* 1969a; Hall 1970; O'Dwyer 1970; *Time* 1970; MSLAC-PA). In addition to the high degree of selectivity offered by cartridges compared with broadcasts, the ability to play a program at one's convenience meant users, from homemakers to third-shift workers, could fit their learning and entertainment into their work–leisure patterns. Building on the established flexibility of the LP as a domestic technology, these negotiations over the EVR suggest that its users could watch “whatever whenever” years before Sony made this a cornerstone of its Betamax promotion.

While cultural critics and content producers concerned themselves with what people would watch on the EVR, others were interested in how they would pay for it—and what this meant for other home entertainment. Again, the LP discursively structured the possibilities open to the EVR. Building on CBS's activities in the music industry, one reviewer suggested that the company could “create, produce and distribute video cassettes the way it now turns out phonograph records and audio cassettes.” Likewise, the public could purchase and collect cartridges just as they do other media commodities—from houseware stores, supermarkets, and music shops (Field 1970). Associations with the LP also influenced how different parties promoted the sale and exchange of

cassettes. While critic Jack Gould included the EVR's lack of commercials in his list of its advantageous LP-like qualities—emphasizing the value of purchasing media outright—he and others also used the LP as a theoretical case study to test the waters for EVR rental (Gould 1970a, 75, 1970b; Isenberg 1970). These possibilities, however, existed in tension with CBS's promotions of the EVR as a “multi-million dollar advertising medium” that situated the device within more traditional U.S. television funding models (Field 1970; O'Dwyer 1970; Brockway quoted in O'Dwyer 1970). Given the high (and rising) price of cartridges for purchase, rental and ad subsidy models became grounds for negotiating the EVR's identity as a media commodity in relation to the LP. CBS used this same relationship to temper the EVR's threat to its broadcast operations by situating the EVR as an “additive” to broadcast that could function “just as record players complemented radio” (*Time* 1968).

While the EVR shared some material features with the LP, the way different users developed the continuities between the two devices made the EVR legible as a new domestic technology that could support critics' legitimation efforts, reshape audiences, lead to new commodity forms, and accommodate broadcasting. These same efforts considered the ideal form of EVR programming and exhibition, including its place in the home. However, the development of the EVR as a domestic entertainment technology was not uncontroversial within CBS. According to Goldmark, Paley issued directives to leave “home” alone and focus instead entirely on industrial and educational applications (Goldmark 1973, 181). Furthermore, Motorola believed that the consumer market would not develop until the late 1970s and understood the primary market for the EVR as “definitely non-consumer”—precisely along the lines of its current operations (hospital, public safety, hotels, schools, business, and government). These users—quite possibly the only groups to ever purchase, program, and use the device—became critical to its development and financing. However, as scholars discuss the EVR as a failed version of *the home VHS* (Video Home System), they have been ignored. Turning to these other sectors opens a broader range of technological, practical, and discursive continuities than has henceforth been identified in histories of video or the EVR.

EVR as a Film Cartridge

Despite the public association of the EVR with the LP, CBS's machine bore an even closer resemblance to 8 mm and Super 8 film cartridges in use a decade before the EVR hit the market. Introduced by Technicolor in 1961, film cartridges stored about five minutes of silent film—increasing to thirty minutes of sound film by 1970—that played back on a specialized rear-projection screen machine the size of a television. In addition to the film cartridge's uncanny ability to deliver what the EVR promised—self-contained, portable software played on a televisual device—the two systems both used film. A late Kodak model drew even closer to the already-defunct EVR by playing Super 8 cartridges on television (*Business Screen* 1973). Despite their mechanical similarities, however, the most important continuities between the technologies lie in the institutions that used them.

Unlike the LP, film cartridges never found success as a domestic technology. Instead, their biggest users were business, industry, and education—the same groups that sustained EVR sales. The EVR’s institutional appeal was strategically bolstered by CBS’s partnership with Motorola, whose activities in the hospital, hotel, public safety, and educational fields, as well as consumer television, enabled it to straddle both markets (*Business Screen* 1969b). CBS and Motorola offered institutions a high-priced “industrial-educational unit of ‘ruggedized’ design” to recoup research and development costs until mass production halved the cost for consumers (*Business Screen* 1969b). This also provided CBS with valuable “test cases” in user evaluation and marketing while transforming institutional users into important intermediaries shaping the EVR’s potential. While critics fashioned the EVR as an audiovisual LP, their counterparts in schools and workplaces fit the EVR to the established media practices within those spaces. For these users, the 8 mm film cartridge helped set the conditions by which the EVR could be imagined as a communications technology.

A forgotten technology, small-gauge film cartridges supported the development of new content production and pedagogical strategies, flexible exhibition practices, and the ongoing refinement of media audiences. Introduced to users primarily working with 16 mm film, marketers distinguished the newness of film cartridges through their portability (fits in a briefcase!), ease of use (no threading; so simple a child can use it!), and specialized audiences (even individual users!; *Business Screen* 1962a, 1962b, 1967b, 1972). Of course, these same arguments supported earlier and ongoing constructions of 16 mm as a flexible, modular technology suited to a range of audiences, locations, and communication needs (Waller 2011; Wasson 2013). Film cartridges, however, intensified these discourses and contributed new protocols and material forms to cinema’s heterogeneous technologies and practices. The small size of the screen and its ability to display in lit conditions meant film could be projected anywhere immediately without extensive set-up—atop a prospect’s desk, in a classroom corner, or on a department store shelf—wherever its messages would be most effective according to sales and pedagogical theories (Palmer 1971, 26). The short length of the cartridge was hailed for offering greater freedom in scheduling audiovisual programs, as it could be easily tucked into larger presentations or shown at precise moments of the school or work day. Manufacturers and users imbricated this cluster of anytime-anywhere-anyone affordances in two larger promises of the film cartridge’s capabilities: expansion and efficiency. The EVR built directly on these promises and concerns.

The EVR’s claims to enabling institutional expansion by facilitating the management of geographically dispersed people built on three elements of access: cost, user friendliness, and exhibition outlets. CBS both ignored film cartridges and plagiarized their argument regarding price by comparing its device with more expensive 16 mm and video formats, positioning the EVR as the “economical” solution to mass duplication needs (Brockway 1971, 28; *Business Screen* 1971). CBS also emphasized its machine’s simple interface, automatic threading, and easy installation to appeal to educators facing another novel technology and a corporate communications sector increasingly transferring employee training responsibilities to workers. Likewise,

CBS promoted the expansive reach of the EVR by emphasizing its portability through features such as the player's size, built-in handle, and—importantly, the affordance film cartridges lacked—its ubiquitous exhibition outlets (“any conventional television receiver, regardless of its location”; Brockway 1971; *Business Screen* 1969a, 1971; Palmer 1971). This emphasis on convenience and ubiquity built on film cartridge practices that established the value of expansive communication and information programs using an “almost always accessible” model—or as a Motorola brochure explains, “whatever you want, whenever you want it”—wherein no space lacked access to corporate communication or educational content (MSLAC-PA).

Notions of efficiency based on temporal flexibility also tied the EVR to film cartridges. Both technologies emphasized quick setup, which freed users from time-consuming preparations prescribed by 16 mm film projection: extra screens, a darkened room, a sizable audience, and an expert projector (*CBS Electronic Video Recording* c1970; Palmer 1971). Media could thus be inserted more precisely and more often within the rhythms of work and learning. In a passage that could have been lifted wholesale from a film cartridge press release, a review of the EVR proclaims,

With EVR, the teacher might integrate educational films more effectively into the smooth flow of his classwork. He could preview and choose. He could stop the program for comment for general discussion. He could schedule lessons at his own discretion (*Business Screen* 1969a).

Such flexibility also supported individualized use; cartridges were hailed as a new pedagogical tool that allowed students—whether children studying music or workers learning welding—to learn at their own pace, releasing the instructor to attend to other responsibilities (Happé 1965, 7; Moore 1971, 58). This emphasis on maximizing efficiency returns in the discussion of the EVR's potential for “home study,” allowing workers to learn both at their own pace *and* on their own time (*Business Screen* 1969a; Gale 1971; Gould 1970c). Combined, these affordances of efficiency and expansion constructed the EVR to echo the film cartridge's capabilities as a highly flexible, adaptable technology that could well serve industrial and educational users' shifting understandings of their ideal audiences.

Although CBS and Motorola made only a handful of programming arrangements over the course of the EVR's short life, these agreements consistently targeted highly specialized audiences familiar with film cartridges. The EVR's marquee deal was an agreement with the Equitable Life Assurance Society for 1,200 players and software for in-house training and communications as well as home study and entertainment for agents and their families. More targeted audiences followed, with content that included diagnosis films for neurosurgery interns, IBM communiqués with minority groups, and “Arresting TV,” recruitment, training, and community relations films for police (*Billboard* 1971; Gould 1970a, 75; MSLAC–News Releases [MSLAC-NR]). In laying out his plans for EVR programming development, EVR President Robert Brockway drew from traditional broadcasting practices by taking up the language of connectivity—“special purpose networks on a vast scope”—to describe his vision

for a communications system targeting geographically dispersed (but highly specific) audiences. His imagined “networks” ranged from consumer service to government communication and included others in between: travel, training, finances, and executive recruitment (*Billboard* 1970a). While the development of small, homogeneous, and strategically important audiences was common to film cartridges before the EVR, the practice also increasingly defined broadcasters’ attempts to capture the attention of smaller, more lucrative elite audiences in the 1970s (Dawson 2007, 538). However, although the EVR might claim relation with broadcasting vis-à-vis the scale of network reach and connectivity, the machine’s claims to institutional efficiency and expansion rested on far more expert narrowcasting enabled by cartridge technologies.

Although their kinship was not promoted like the EVR’s association with the LP—doubtless to avoid giving their most direct competitor press—the film cartridge was the EVR’s closest relative, passing on its genes via shared protocols and material design. The EVR, however, established its newness and distinguished itself from film cartridges through its televisuality. On the one hand, EVR ads suggest that the associations people hold with television as popular entertainment make it more effective as a teaching and communications medium. “More personal than 16 mm film,” the EVR “holds the attention and interest” of viewers by exploiting the “inherent fascination” young people have in television; put otherwise, “people like to watch television . . . your salesmen might bring in extra business if they spent more time watching TV” (*Business Screen* 1970). On the other hand, when the EVR sought a leader position amid an already messy format war between film cartridges and a similarly crowded video market on the horizon, Brockway used CBS’s deal with 20th Century Fox for 1,500 feature films duplicated on the EVR for home rental as his trump card; the EVR’s dual capacity as an industrial and consumer technology reinforced its potential as an already omnipresent communications juggernaut. These twined facets of the EVR, its ability to mimic film cartridges’ controlled management of content and audiences while remaining televisual in its intimacy and scale, proposed a point-to-point version of television as a precise communications instrument for education, work, and sales sustained by affective efficacy.

EVR as Print

One of the more radical capabilities of the EVR developed convergences with the oldest form of mediated communication. Although commenters likened the EVR to “published TV” and books “in the form of moving pictures” to make sense of the difference between video’s re-record capabilities and the EVR’s software ambitions, the CBS device also contained the unique capability to store traditional print information—a lot of it (Canby 1970, 32; Knoll 1972, 10). Unlike existing video, which lacked pausing capabilities, and traditional film stock, which burns if stuck in a projector gate, the EVR’s still-frame capacity for microfilm-like storage allowed users to hold on any one of its reel’s 180,000 frames as long as desired. Just as one might return to an earlier chapter, skip a section, or use an index, users could use rapid reverse, fast forward, and track switching controls to “seek out” information stored on any one of the cartridge’s

numbered frames. A crawl mechanism allowed users to move frame by frame—or page by page—through the entire cartridge. The content suggested to best exploit such affordances included books, diagrams, equations, blackboard charts, and illustrations that could either be interspersed with moving images or fill an entire cartridge (Gould 1968, 38; Wren-Lewis 1968, 46). Although the EVR's ability to store diverse materials impressed institutional onlookers, it was the "almost limitless" magnitude of these capabilities—over five hundred books on a single 7-inch cartridge, for example—that led to predictions that it would dramatically affect traditional print repositories and filing systems (Canby 1970, 31; C. Smith 1970, 27).

The print-television hybrid mirrored CBS's corporate strategies. During the EVR's development, the communications giant was strategically acquiring diverse holdings in education and information fields. In 1967, CBS purchased Holt, Rinehart & Winston, an educational firm that netted \$70 million annually through its publication of textbooks, novels, nonfiction, periodicals, and handbooks. By 1968, the conglomerate's CBS/Holt group also included two film companies creating educational audiovisuals and the CBS Learning Center, which "researched methods for educational application of CBS products and services" (*Barron's National Business and Financial Weekly* 1968). Combined with CBS's Broadcasting, Film, and Columbia (music) Groups, these holdings provided CBS with "deep resources" for EVR programming (Rosenblatt 1971). Indeed, one of the earliest publishing deals for the EVR was signed by the CBS-owned W.B. Saunders Company, a publisher of medical books, correspondence courses, and audiovisual aids (Canby 1970, 31; Goldmark 1973, 172).

CBS's own holdings, however, comprised a fraction of the print materials destined for the EVR. Other interests experimented with television's "print" possibilities, most regarding the EVR as a moving-image supplement to traditional titles. Popular Science Publishing, for example, developed series based on content in *Popular Science* and *Outdoor Life* (*Billboard* 1970b). The *New York Times* likewise envisioned programming for the EVR—beginning with a series for schoolchildren—as a means to expand the reach of their "informational resources" to a variety of consumers, from librarians to business professionals (*New York Times* 1968). Not all projects were based on pre-existing properties; the *Computer TeleJournal* "magazine" planned to feature "articles" on data processing for closed-circuit television screenings at relevant plants. Although little besides vocabulary ties the *TeleJournal* to print forms, its advertising-supported revenue plan recalls the already hybrid magazine sponsorship model made famous by NBC's *Today* (*The Wall Street Journal* 1969).

While these intersections between the EVR and print played with the content, form, and ideal audiences of television, others imagined more ambitious uses for text-based cartridges. Goldmark's promotion of the EVR as a content storage system crystallized in his plans for a massive (but unexplained) video reference book called *Knowledge EVR* (Goldmark 1973, 201). Others likewise pointed to the economy of a system that could make the entire *Encyclopaedia Britannica* available on a single cartridge for less than \$15 or suggested the educational benefits of reading a book on the home TV (DeMott 1971, 40; Gould 1968, 38). Pursuing the logical conclusion of the EVR's substantial and relatively inexpensive storage capacity, Goldmark predicted "great

libraries of special film containing much of the world's information . . . available across the country" (Goldmark, quoted in Rubinstein 1976). The EVR—and by extension, television—was not only a new venue for traditional publishing interests, it was an entirely new way of storing, distributing, and exhibiting printed materials.

When Goldmark proposes that the EVR is "the greatest communication revolution since the book," his enthusiasm of the novel nevertheless invokes continuities—on the level of content, industrial organization, economic models, audiences, and affective meanings—with domestic entertainment television and broader information, publication, and content storage systems used across leisure and labor contexts (Goldmark quoted in DeMott 1971, 40). The publishing industry made a logical ally for an increasingly non-discriminatory outlet for content boasting significant storage capacity that desperately needed content (that did not compete with broadcast holdings). Furthermore, the target markets already developed within the print world translated nicely to CBS's pursuit of increasingly specialized audiences. Despite this emphasis on print, however, CBS classified the EVR within the cutting-edge research of the CBS/Comtec Group responsible for "developing and applying communications technology in education, industry and the home" (*The Wall Street Journal* 1967). Often invested in supporting what participants referred to as the "knowledge industry," these efforts frequently played with emerging and not-quite-possible technologies, searching for new avenues for interactive and interconnected communications (Jones 2000, 80R4).

EVR as Interactivity

Unlike the three previous continuity lenses, "interactivity" is not a specific medium so much as it is a cluster of technological affordances articulated to a variety of media that concern some sort of reciprocal engagement either with or through a particular device. Presaging 1990s' masculinist discourses recuperating the "feminine" passivity of television through virtual reality (Boddy 2004, 69–70), EVR's promise of "a new age, that of *manipulable* television, TV under the viewer's direct personal control," led to prognostications that ranged from the individual's customization of content to democratic participation (Canby 1970, 31, emphasis in original). These conceptions, however, relied on different technological underpinnings. Customization was based in time shifting and alternative programming enabled by uncoupling television from broadcasting while the dual-track capabilities of EVR cartridges led others to promote its "infinite possibilities for visual instruction" wherein programs split complementary information, for example, questions and answers, between tracks (C. Smith 1970; Yarborough 1971). Alongside pause, rewind, fast forward, and random access, the EVR as an interactive teaching machine promised users greater "involvement" in their media, considered crucial for improved learning (Yarborough 1971).

In addition to serving as a home entertainment technology, a skilling machine, and a rather bulky e-reader all on its own, the EVR was pulled into persistent cultural fantasies (Jenkins 2006, 16) concerning Frankensteinian black box technologies that cobbled together existing machines—in the EVR's case, display monitor, keyboard, video, picturephone, cable hookup, TV antenna, online processing capabilities, and

even a printing function—to create an “all-purpose home communication terminal” offering “all the information services ever envisioned”: electronic paper and mail delivery, information banks filled with all varieties of content, two-way communication, video playback, computer-aided instruction systems, online information processing and management, and, of course, advertising (Martin 1977, 4–8; O’Connell et al. 1969, 37; Parker 1974, 4). In these and less totalizing visions of interactive technologies that paired the EVR with a couple devices, the EVR functioned primarily as a mechanism for storage and retrieval, sometimes—TV monitor assumed—supplying the “terminal.” Despite its prominent associations with cable—understood as a two-way communication technology—the EVR operated chiefly as a “library” that users could sample at will whether they owned a player or not (Gould 1970c, 21; Isenberg 1970). This mode of “interactivity” offered an intensified version of the customization hailed by television’s critics—one that capitalized on EVR’s capacity to manage print—by sketching out a technology that allowed users to access any published content at the moment desired.

This hyper-individualized “interactivity” with all-purpose information machines translated to interactivity with larger social systems when their two-way affordances enabled content sharing and communication among users. The EVR—incorrectly categorized under videotape—appeared in plans for Instructional Television Systems (ITS) as a medium of “delayed instruction” delivered to off-campus students and supplemented by “talk back” sessions during a faculty member’s office hours (Martin-Vegue et al. 1971, 947–48). More extensive plans envisioned the EVR as part of a democratic information resource—a “public information utility”—that could store massive quantities of information “at public expense in the public interest” and would “guarantee to every citizen the right of access to both the sending and receiving ends of a major medium of public communication” (Parker 1974, 4). The most radical plans for the EVR’s role as a technology of social connection saw it as a means to overcome geographical distances between people and maintain or reshape the spread of populations (O’Connell et al. 1969, 33–34; C. Smith 1970, 27). These possibilities are most clearly identified by Goldmark in his New Rural Society (NRS) project, the HUD-financed program of research and development he followed (potentially during and) directly after EVR’s “failure.” Although the EVR preceded NRS in its execution, the latter plan—the “culmination of a life’s work”—incorporated EVR-like technologies to pursue goals Goldmark entertained since 1968 (Goldmark 1973; W. D. Smith 1972). Using sound and video recording, satellites, cable, “faxmail,” educational broadcasts, and other experimental technologies, Goldmark hoped to solve urban overpopulation problems by transforming resource-poor rural areas into desirable living communities through technologies that attract businesses and make high-quality medical services and education at a distance possible. A radical intensification of EVR’s interactive black box logics and its distributive potential, NRS believed technologies could (re)distribute people.

Imagining EVR’s interactivity as part of larger communication systems sought radical transformations of television’s informational and social connectivity capabilities. While on a broad scale, the marriage between the EVR, computing, and cable shaped television into a vital instrument for education, business, medicine,

and citizenship, for individual users, such black box systems promised a new way of managing and accessing information as well as communicating with others. As part of a new communications center for business and the home, discourses surrounding the EVR presaged both home computing and the Internet—quite the feat for an unsuccessful home video format.

EVR as TV

Reflecting on its failure, Ellis Rubinstein, the editor of *IEEE Spectrum*, suggested that “EVR was a radically new technology—too new, in a sense, for everyone involved with the project” (Rubinstein 1976, 96). More than a singular failure of home entertainment technologies, the EVR is a spectacular series of failures that touched on a variety of aspirations regarding the possibilities of electronic communications held by a range of intermediaries occupying different sectors. By focusing on the EVR as a threshold format, rather than a failure, we can use an analysis focused on continuity and divergence to better account for how the EVR occupied a transitional position along several different avenues of technological development. Doing so reveals that the EVR was not so new as its proponents suggested.

Following Jonathan Sterne’s suggestion to trace the histories of “possibilities” (Sterne 2003, 2), we can pursue these strands—the EVR as a phonograph, film cartridge, print, and interactivity—to locate how different sectors undertaking what appear to be far-removed communications projects were all engaged in laying out new possibilities for television by experimenting with other technologies, content forms, exhibition practices, audience formations, uses, alternative temporalities, and information management functions. While other case studies are needed, attending to threshold formats may well be one strategy for better understanding the underexplored role that non-entertainment industries and institutions (hospitals, hotels, business, government, education) hold in the development of emergent technologies and media practices. The convergent thinking that defined the EVR’s newness alongside its claims on older technologies reveals little about how user cultures used the device, but much regarding how these intermediaries were engaged in efforts to produce the conditions for certain kinds of convergent media practices that break down distinctions between work, learning, and leisure demanded by reigning industrial and educational interests and the emerging “knowledge industry.” This short-lived process both reflects long-standing corporate engagement with convergent media and presages the capitalist underpinnings of contemporary convergence (Andrejevic 2011; Driscoll and Gregg 2011).

Allowing our familiarity with histories’ successes to obscure our understanding of its failures risks shortchanging those technologies—and their supporters—that entertained ambitions far greater than those we attribute to them now. Under the guise of failure, the EVR—when remembered at all—is regarded as a home video format. Much like obsolescence (Henning 2007), the “failure” of the EVR as it is constructed historically has been manufactured through the establishment of equivalences among small-format video players. Such equivalences render the EVR’s most radical potential irrelevant while simultaneously setting the stage for subsequent technologies to

claim newness in ignorance of their continuities with threshold formats and the cultural desires that animated them.

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2. A fog surrounds the extent to which the EVR (Electronic Video Recording) was put into operation, when, and by whom. The 1971 figure comes from the above-cited CBS advertisements.
3. Many of the promotional materials I consulted come from the Motorola Solutions, Inc., Legacy Archives Collection, Consumer Products, Teleplayer, and Electronic Video Recording System series (MSLAC). Subseries are indicated via abbreviations PA (Promotional and Advertising Materials) and NR (News Releases).

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