

THE FLICKER AND RELATED PROJECTS

According to his own oft-repeated account, Tony Conrad's career as a filmmaker can be traced back to an experience he had on the night of March 5, 1963, in the fifth-floor apartment he shared with filmmaker Jack Smith at 56 Ludlow Street in New York City. A trained musician and an active member of New York's avant-garde music scene, Conrad was playing records and recording ambient sounds while Smith directed his muse, Mario Montez, to pose in front of the flickering light of a lensless 16mm film projector.¹ As Conrad remembered in 2003, the projector's

intermittent illumination caused a rapturously hallucinatory glow to suffuse the image before us. Neither Jack nor I had ever seen so compelling and luminous a visionary spectacle; it posed immediately the question, how, or whether, such a visual presence might ever be delivered in film.²

In his first and most famous film, *The Flicker*, 1966, Conrad would use sequences of solid black and white film frames to recreate for audiences that same "compelling and luminous" experience of flickering light. Although he began making conceptual word scores as early as 1961, when Fluxus was emerging from the teachings of John Cage, Conrad's reputation as an artist is anchored through *The Flicker* to the world of underground film in New York in the 1960s, a social and creative milieu in which he was embedded. Smith, in particular, played a major role in Conrad's development as a filmmaker, involving him in the sound production for his films *Scotch Tape*, 1959–62, and *Flaming Creatures*, 1962–63.³ Conrad subsequently was involved in the creation of soundtracks for works by other underground

filmmakers, including Ron Rice's *Chumlum*, 1964; Piero Heliczer's *Joan of Arc*, 1967; and Ira Cohen's *The Invasion of Thunderbolt Pagoda*, 1968 (fig. 129). Tellingly, the revival of interest in Conrad's work was spurred in part by the inclusion of *The Flicker* in the 1996 Museum of Contemporary Art, Los Angeles, survey *Hall of Mirrors: Art and Film Since 1945*, which helped form a new canon of moving-image art. Although he abandoned film for video in the early 1980s, Conrad returned to working with film just as his reputation as a visual artist was flourishing, highlighting its importance to his artistic practice. For example, in 2009, he used the material he saved from the editing of Smith's *Flaming Creatures* to create a four-projector 16mm film installation titled *Re-Framing Creatures* (figs. 29 and 30).

While Conrad is still most widely known in the art world as a filmmaker, few appreciate that his interest in film was influenced by his early exposure to another, newer media technology: the computer. On his summer breaks from high school and college, Conrad spent time with Harold V. "Mac" McIntosh, a mathematician who worked with research computers, including the ENIAC and the IBM 704, at institutes in and around Conrad's hometown of Baltimore. In the summer of 1960, when Conrad was studying mathematics at Harvard University, he joined a number of other students in Copenhagen, where they worked under McIntosh on the DASK, Denmark's first computer. The next summer, Conrad worked again under McIntosh at the Summer Institute in the Theory of Large Computing Devices at the Research Institute for Advanced Studies (RIAS) in Baltimore. "In short," Conrad later recollected, "by the time I met with [electronic music composer Karlheinz] Stockhausen in Cologne [in 1961] I had not only struggled

fitfully through three years of math courses at Harvard, but far more to the point, I had been immersed in binary machine code."⁴ In 1962, Conrad graduated and moved to New York. After a short stint as a lab assistant for an optical company in 1965, his first significant job was as a computer programmer for LIFE Circulation Company (the magazine's accounts receivable and market research subsidiary) from 1965 to 1966.

Computing was more than just Conrad's day job, however. In 1965, before he finished *The Flicker*, he created an IBM computer print-out of sixty continuous-format pages, each covered in a grid of hundreds of impressions of the capital letter H (fig. 31). The first of Conrad's many objects to connect multiple artistic disciplines, *H* is both a concrete poem that produces a monotonous sound reminiscent of Conrad's contemporaneous explorations of drone music, and a work of visual art with a material specificity that locates it somewhere between a print and a sculpture. (When *H* was exhibited for the first time—at The Kitchen in New York in 2016—its accordion-folded pages lined a vitrine.) Less obviously, it is also a kind of film, with its columns of capital Hs evoking the successive rectangular frames of a filmstrip and its continuous-format pages evoking a ribbon of celluloid unspooled from a reel. As Conrad recounted in an email in 2015, "In 1962 I had already been asked by a computer teacher [McIntosh] about whether I had any interest in producing an animated film using the [IBM 704 computer] printer, and I had rejected that idea (a decision I sometimes regret having made). I mention this only because it was unquestionably my aim with *H* to generate a minimalist print work in a format analogous to film."⁵

Only recently brought to light by the artist, *H* modifies the existing narrative of Conrad's artistic career, indicating that his famously interdisciplinary approach to filmmaking was bound up with computing from the very beginning. In fact, Conrad was one of the first artists anywhere to work with digital technologies; it was only in 1965, the year he made *H*, that computer prints were shown for the first time in a gallery context.⁶ Yet Conrad's artistic concerns at the time he made *H* could not have been further from the field of "computer art" that was then emerging as a consequence of new developments in computer graphics. Associated with Op-like geometric patterns, ASCII images of people and everyday objects, and animations of linear forms, the first generation of computer art was largely defined by industrial researchers focused on generating compositions that emulated familiar analog imagery. While these scientists-turned-artists explored the computer's increasing potential to automate the production of "art"-like

images, Conrad instead produced works, like *H*, that focus our attention on the computer as a general-purpose calculating machine, one that reduces information to discrete units and subjects those units to programmed operations. Informed by his training in music, mathematics, and coding, these early works acknowledge that modern computing relies on both the quantification of data and the manipulation of that data by logical rules, while also exploring the aesthetic consequences of computing as a new medium.

Of these consequences, Conrad seems to have been most preoccupied with convergence, or the idea that the digital encoding of all information (whether numbers, text, sound, or image) would lead to the erasure of distinctions between mediums. The idea can be traced in Conrad's work at least as far back as the beginning of his long tenure in the Department of Media Study at the University at Buffalo—the first academic department in the United States devoted to the study of media in all its forms. In 1976, video artist Woody Vasulka invited Conrad to come teach in Buffalo; despite the fact Conrad had never made a video, Vasulka hoped that Conrad, a computer programmer-turned-filmmaker, would be able to contribute to his work on a theory of video as a "binary" medium. Decades later, Conrad noted that while he was not interested in Vasulka's theory, they did share an interest in "what we later began to call convergence. That is, that finally, everything, including text and image and sound, as well as numbers, data, would converge into digital information and be manipulable as digital information."⁷

Since at least the 1980s, the convergence of all information streams in the 0s and 1s of binary code has been identified as a definitive characteristic of digital computing by the most prominent theorists of media technologies, including Friedrich Kittler and Lev Manovich. As both these theorists and art historians, such as Rosalind Krauss, have noted, convergence offers another refutation of the ideal of medium specificity that undergirded the history of modernism from the late-nineteenth to the mid-twentieth centuries.⁸ If the process of digitization effaces the material distinction between, for example, a drawing and a photograph—as both may be scanned into the same JPEG file format—convergence promises to disrupt more profoundly the notion of a medium: it supposes that after digitization, there is no longer any distinction between the files that encode, for example, a photograph and a song, as a JPEG image file can be translated algorithmically into an MP3 audio file and vice versa.

Not coincidentally, the desire to challenge the ideal of medium-specificity is one of the

major threads that tie together the various phases of Conrad's long career. His fascination with digital convergence can be understood as an expression of his lifelong commitment to challenging the conventional boundaries of artistic mediums, demonstrated by works such as the *Yellow Movies*, 1972–73 (see pages 132–55), and to challenging all social conventions more broadly. For example, Conrad reimaged *The Flicker*, which began as a 16mm film (and has been discussed, somewhat misleadingly, as a kind of modernist, self-reflexive meditation on the nature of film), twice: first in the 1980s as a real-time digital animation made on an Amiga computer and again in 2008 as an improvised sound work based on the idea of pulse delays and performed on a twelve-channel analog audio synthesizer engineered and built by Conrad himself.⁹ In a statement published in 2012, Conrad reflects back on his digital transformation of *The Flicker* in the 1980s as motivated by his desire to make work that would prove that mediums were obsolete—although, as he admits, the medium *did* still matter in the days before the full maturation of personal computing: "In the '80s I (re)programmed my film *The Flicker*, 1966, to play on an Amiga computer. I figured work that was transportable between technologies could shatter gizmo prudery. But instead it turned out that technologies *were* boundaries, curtains of invisibility—at least until around 1995, when everything converged in a digital soup."¹⁰

As the evolution of *The Flicker* demonstrates, the idea of digital convergence—not necessarily the technical reality of it, but rather, the *theory* of it—arguably informs Conrad's work. It appears not only in his works that make use of digital technologies, such as *H*, but also in his works made with analog film and especially the "flicker films" of his early career. While terms like *digital art* historically have been used to identify works that are made with, and are "about," digital technologies (in the same way that high-modernist painting is made with, and is "about," paint), they are insufficient to describe the landscape of art today, where works made with digital technologies are not necessarily "about" those technologies and works that are "about" digital technologies are not necessarily made with those technologies. Further, terms such as *digital art* and *internet art* are being attenuated by the increasing imbrication of analog and digital images and processes, and by the erosion of the very medium-specificity that binary code renders obsolete.¹¹ In the context of these developments, Conrad's work suggests that we abandon our preoccupation with what has been identified as "digital art" and instead focus on what we may call the "digital imaginary"—that constellation of theoretical, philosophical,

ethical, and aesthetic issues raised by digital technologies that is now the subject of artists working in all imaginable mediums.

Framed by the concept of the digital imaginary, the import of Conrad's work becomes more clear: just as his painted *Yellow Movies* prove that movies need not be made with film, his early 16mm movies prove that "digital art" need not be made with computers. These films are "digital" not only because they rely on the systematic execution of logical "programs," but also because they investigate the commutability of data between sound and image, which functions, in the context of Conrad's life and works, as a harbinger of digital convergence. Of course, visual music—or the idea of using abstract visual compositions, such as patterns of colored lights, to express musical concepts or "illustrate" musical sounds—is centuries old, but it was in the twentieth century that artists began working with electronic technologies to create connections between sounds and images on a technical basis. For example, Tony Martin, an artist working at the experimental San Francisco Tape Music Center in the 1960s and whom Conrad met shortly after completing *The Flicker*, helped pioneer the use of analog synthesizers to transmute live rock music into real-time light shows.¹² No doubt influenced by his time in the 1960s with the Theatre of Eternal Music (fig. 21), which presented acoustical experiences in tandem with painted images and changing lights, Conrad's early films are "coded" explorations of the "convergence" of sound and image, or sound waves and light waves, first as abstract metaphor and ultimately as material fact.

Since its first screenings in 1966, *The Flicker* has been interpreted as a film about the act of projection—that is, as a film about the very nature of cinematic images. Admittedly, the film's title and minute-and-a-half seizure warning foreground the idea that it is a film made with, and about, flickering light (fig. 32). (The warning is accompanied by ragtime piano music redolent of the era of silent film—paradoxically privileging the film's visuals over its sounds.) While seizure is certainly a risk for some viewers, the film can produce visual discomfort in any viewer; photos of an early public screening at the Fourth New York Film Festival at Lincoln Center show some people averting their eyes or grimacing (fig. 35).

Perhaps because early discussions of *The Flicker* emphasized the modernist self-reflexivity (P. Adams Sitney) or affective power (Malcolm LeGrice) of its flickering light, most subsequent mentions of the film fail to explain that its flickering is articulated into distinct patterns Conrad derived from his lifelong interest

in musical harmonics.¹³ As he explained in an interview in 2004,

Since I'd been involved with music and working with harmonic structures and with rhythm, both of which also depend on frequency relationships, it occurred to me that it might be fascinating to develop a whole compositional structure that used flickering light as its medium. . . . Of course, you could have regular strobe lights or you could simply turn a light on and off, but to actually compose using different frequencies of flicker and to try to relate them in a way that might invoke something like harmonies between the different flickering frequencies—this seemed to me a weird but very interesting challenge, one that held the potential of opening a whole spectrum of experience, much in the way that drugs, and Jack [Smith]'s work, had opened alternative kinds of experience for me.¹⁴

In other words, *The Flicker's* forty-seven distinct arrangements of black and white frames (each of which repeats ten times) represent Conrad's attempt not simply to lay bare the filmic apparatus or to induce altered states of consciousness, but also to encode the musical principle of harmonics in a visual composition.¹⁵ As early as November 1965—when he composed a letter to Henry Romney that was included as part of a dossier on *The Flicker* in the Summer 1966 issue of *Film Culture*—Conrad wrote, "I found as I worked on the film that this same concept of rhythmic harmony turns out to be basic in the visual aspect as well. In fact, it seems that *The Flicker* may be interesting primarily as a basic study in the effectiveness of a whole range of operable visual harmonic relationships."¹⁶ Inspired by the example of harmonics—which arranges discrete notes into complex sounds—Conrad approached film as a series of discrete images (black or white frames) that could be systematically arranged to create a complex visual composition. Thus, although not digital itself, *The Flicker* deploys a kind of digital operation—namely, rearranging discrete units of data—in order to explore the resonances between patterns of sound and of light.

When it came time to make the soundtrack for *The Flicker*, Conrad wanted to work with a spectrum of sound, just as he had worked with a spectrum of flickering light.¹⁷ Specifically, he would work with the spectrum of audio frequencies in which rhythms turn into pitches and vice versa, building on an early experiment in which he had sped up a recording of a metronome until its rhythm became a pitch.¹⁸ In

order to create frequencies in this liminal zone, Conrad used a sine wave generator, which had been given to him by Harold McIntosh, to drive a series of small buzzers wired together in various arrangements; he then subjected the noise of the buzzers to live tape-delay echo and feedback effects, both hallmarks of the minimal music that he helped pioneer.¹⁹ The recording of this performance on reel-to-reel tape, which makes up the film's soundtrack, was originally played through two speakers on opposite ends of the theater during screenings; it was only later that the soundtrack was added to the film print itself. While there is no material relation between image and sound in the film, Conrad's manipulation of both as frequencies reduces them to a common denominator, just as binary code reduces them to 0s and 1s.

Because its visual effect depends entirely on the phenomenal experience of the temporal juxtaposition of its discrete units (that is, black and white frames), *The Flicker* resists reproduction as individual film stills. When filmmaker Jonas Mekas—who had given Conrad the stock he used to make the film—asked Conrad for a diagram of *The Flicker* for publication in *Film Culture*, Conrad decided that, instead of giving Mekas the original chart of the film he had made on paper, he would "code it in a way that will make it illegible" by making "a sculpture, using small tiles to represent the frames," which he then photographed (fig. 36).²⁰ Inevitably, this two-dimensional expression of the film in "code" does not readily convey the harmonic principles behind the images, which manifest more obviously in the viewer's experience of the varying rates of flicker (even if it does suggest the film's connection to Conrad's musical interest in "static" forms and experiences).²¹ It also suppresses the importance of the film's soundtrack, contributing to the interpretation of the film as a modernist reflection on filmic projection.

With the support of his wife Beverly Grant, Conrad would go on to make more complex "flicker films" by introducing the graphic alternation of black and white *within* each frame, or by expanding the flicker into multiple channels of projection. These include *Straight and Narrow*, 1970 (fig. 37), in which patterns of white and black vertical and horizontal stripes, based on an optical toy called Benham's top, create the impression of shifting colors in warm and cool tones; and *Four Square*, 1971 (fig. 40), an environment that Conrad described as "an intense optical journey into Red" through the "simultaneous projection of four identical color flicker films on four screens arranged in a square around the audience."²² The former film was screened at both The Museum of Modern Art and the Whitney Museum in New York, while the latter was

shown weekly as part of the festival *Sonsbeek '71: Sonsbeek buiten de perken (Beyond Lawn and Order)* in Arnhem, The Netherlands, and together they helped to secure Conrad's reputation as an avant-garde filmmaker of the first rank on both sides of the Atlantic.²³

According to Conrad, however, his "checkmate in the 'structural film game,'" his "apogee in formalist design," and "the work with which I closed out my interest in combinatorial and logical structures," was his 1975 film *Articulation of Boolean Algebra for Film Opticals* (fig. 38).²⁴ Crucially, in *Articulation*, the essential feature of the flicker film—a rapid alternating between two colors—is tied explicitly to the binary language of digital code. First put forward by George Boole in *The Mathematical Analysis of Logic*, 1847, what later became known as "Boolean algebra" is a system for representing logical statements using the binary values "true" and "false," which can be encoded as 1 and 0, respectively. As Conrad himself noted, this is "the same binary logic used in computers," hence the name for "binary code."²⁵ From the perspective of Boolean algebra, flicker films made of solid black and white frames—in other words, films in which there are only two values—are an instance of "high contrast" logic.²⁶ For *Articulation*, Conrad wanted to use the operations of Boolean algebra—AND, OR, NOT, and EXCLUSIVE—to "program" a flicker film in which double exposure and bi-pack printing are used in various combinations to produce shades of grey as well as black and white. The final seventy-five minute film, which contains 720 possible combinations of six stripe patterns, suggests the idea, first put forward by Conrad with *H*, that computing, rather than depending on particular machinery, is simply a matter of manipulating information using logical operations, and that as a consequence, digital art may be realized in any material.

As in *The Flicker*, the composition of the visual elements of *Articulation* relies on the application of musical principles to visual art. Conrad even claimed that *Articulation* was "a response to what one might imagine as a call for an idealized relationship between sound and image."²⁷ Before screening segments of the film at a 2006 conference at Brown University, Conrad explained, "Curiously, and not coincidentally, the blinking light part of the visual spectrum corresponds to the audio frequencies of metric events, the flicker spectrum corresponds to rhythms, and the graphic design part of the film image spectrum corresponds to audio pitches."²⁸ Beyond these "curious" effects, though, *Articulation* introduced a material correspondence between sound and image: because the stripes span the width of the celluloid, including the area

for the optical soundtrack, the film "does not discriminate between the picture area of the filmstrip and the audio area of the filmstrip," as Conrad himself noted.²⁹ As a result, the film projector transforms the same information that is in the "picture area" into audible sound, "plipping and puttering and humming sometimes like a trapped housefly and sometimes like a contented bumblebee," as one reviewer described it.³⁰ While this technique "unified sound and image more thoroughly and more consequentially than in any other film," as Conrad claimed, it is admittedly a wholly analog technique—and in fact, the same strategy would be used by other avant-garde filmmakers, including Conrad's friend Paul Sharits.³¹ Yet *Articulation's* deployment of Boolean logic explicitly links it to the digital imaginary, making clear that its analog convergence of sound and image is in dialogue with the digital convergence of sound and image in the form of binary code. In Conrad's words, it "addressed the problem of how the filmstrip might function as a site of convergence among photography, cinema, and sound, using a binary code (black and white stripes) as my vehicle."³²

Although *Articulation* would not be completed until 1975, when it was screened for a week at the Whitney, Conrad was already contemplating using Boolean algebra to program moving images when he began preparing the 1972 premiere of *Ten Years Alive on the Infinite Plain*. Presented at The Kitchen in New York, this interdisciplinary work combined flickering film projection with the live performance of drone music by Conrad, Rhys Chatham, and Laurie Spiegel. "Was it possible, I wondered, that video signals might be combined to form such an algorithm, generating an EXCLUSIVE OR effect in real time? I brought this issue to The Kitchen, where the Vasulkas [who had founded The Kitchen the previous year] had an impressive array of video effects generators."³³ According to Conrad's own account, then, it was his attempt to use binary logic to generate moving images that first ignited his interest in video as a medium. Importantly, with analog video, Conrad encountered a technology that encodes both sound and image in a continuous flow of information, unlike the discrete images of film cells, which Conrad related to the quantified data of computer programming. If Conrad's films are informed by the dream of the convergence of sound and image, and more broadly, of the liquidation of mediums in the substrate of digital code, then Conrad's first experiments with video in the 1960s and 1970s demonstrate the elusiveness of that dream.

In keeping with the interdisciplinarity of his artistic practice, Conrad introduces television technology into his oeuvre by placing it into dialogue with film.³⁴ The final version of

Conrad's first film after *The Flicker, The Eye of Count Flickerstein*, 1967 (revised 1975), consists of nothing but an unedited shot of static playing on a television set that appears rotated on its side (in fact, Conrad filmed with the camera turned on its side).³⁵ While the electronic scan-lines of a television monitor normally cross the screen horizontally, the lines in *Count Flickerstein* mimic the vertical movement of celluloid through a projector and the corresponding vertical movement of film frames on a screen. By attempting to force television to conform to the apparatus of film, Conrad only highlights their technological incompatibility: while both technologies are analog, film comprises a series of discrete, static images, while television comprises a continuous flow of information.³⁶ (It would be two decades before the digitization of both film and video would allow software to flatten, if not fully erase, the technological differences between the two formats.)

Conrad similarly explores the technology of television, and its incompatibility with film, with the installation *Yellow Movie (video)*, 1973. As it was originally installed at The Kitchen, the work consisted of forty ersatz television sets made of rectangles of black card, each with a rounded rectangle of silkscreened fluorescent paint that glows opposite a bank of black lights, whose electric hum is amplified by contact microphones (fig. 66). The rounded, glowing "screens" of *Yellow Movie (video)*, which evoke the rounded corners of cathode ray tube (CRT) television sets, are an obvious permutation of the black rectangles of Conrad's *Yellow Movies*: just as the *Yellow Movies* transmute paintings into movies, *Yellow Movie (video)* transmutes the *Yellow Movies* into television. While Conrad's transmutations emphasize that what movies and television have in common is duration—they are both now referred to as "time-based media"—*Yellow Movie (video)* demonstrates that television is a uniquely electronic medium, as a key element of CRT televisions is a phosphorescent coating (comparable to the fluorescent paint of Conrad's "screens") that is activated by modulations of electricity.

In the same vein as *The Eye of Count Flickerstein* and *Yellow Movie (video)*, *Film Feedback*, 1974 (figs. 41–43), is the result of an absurd attempt to replicate the immediacy of televisual technology, which was argued to be its determinant feature.³⁷ In a vain attempt to approximate the near-simultaneity of video and television—in which recording, transmission, and reception can be separated only by milliseconds—*Film Feedback* truncates the time lag between the successive stages of shooting, developing, and screening a film. As outlined in a diagram of the work, the film was made by continuously running a loop of film between

a camera pointed at a screen, a darkroom for developing the film, and a projector pointed at the same screen; the projected image was recorded by the camera on the film, which was immediately developed and then run through the projector, screening a new image that was recorded by the camera on the same loop of film, and so on.³⁸ As the byproduct of this real-time feedback loop, the finished film captures a series of slowly receding rectangles or screens-within-screens that decrease in resolution.³⁹ With its almost elegiac tone—the only image in the film, aside from that of the screen itself, is of a single burning candle, used to focus the camera—the work uncannily prefigures the debate over the demise of film as a medium, occasioned first by the arrival of television (which led to a dramatic decrease in moviegoing) and later by the arrival of high-quality digital video, which threatened to render celluloid technologically obsolete.

Notably, *Film Feedback* was soon followed by Conrad's 1976 work *Fade*, in which the artist insists that media technologies are as much about the experience of loss as about extending memory (fig. 45). By taking an original image and then making successive generations of increasingly lighter copies using a Ditto machine (copying each copy sequentially), Conrad produced a collection of hundreds of sheets of paper in which the copied image first degrades and then disappears before our very eyes. Conrad called this work a "flip book" of "spirit prints," making a pun on the machine's use of alcohol solvents, while also underscoring its ghostliness.⁴⁰ *Fade* is further evidence of Conrad's interest in the relationship between artistic mediums, or storage formats more broadly, and the experience of time, and it points toward the philosophical and material challenges of archiving and conserving digital media, which give the lie to digital data's promise of infinite and flawless reproducibility.

Made just a year after *Fade*, *Cycles of 3s and 7s*, 1977, is Conrad's first significant work of video art and one of only two to be widely distributed. Like much video art of the 1970s, it is a single-take video in which the artist, alone in his studio, performs a repetitive act for the camera: in this case, punching in calculations on a handheld digital calculator, the image of which fills the screen (fig. 44). Included in Chris Hill's 1995 Video Data Bank compilation *Surveying the First Decade: Video Art and Alternative Media in the U.S. 1968–1980*, which helped shaped the canon of early video, *Cycles* is, on its surface, a parody of educational TV and video programs, exemplifying Conrad's dedication to critiquing old and pioneering new pedagogical models, as seen in later

projects such as *Beholden to Victory*, 1983; and *Homework Helpline*, 1994–95 (figs. 88 and 119).⁴¹ Throughout the video, Conrad tries to calculate rational numbers with factors of three and seven that approximate the value of one; as he later explained, his goal was to discover new frequency intervals as complex as those found in some forms of non-Western music.⁴² Importantly, we both see the numbers on the screen and hear Conrad narrating them at the same time; in this regard, the work is indebted to some of his analog films, which also form a bridge between image and sound through the use of a logical system.⁴³

Relative to Conrad's early films, however, *Cycles* introduces an important development: rather than merely alluding to the digital imaginary, whether through the idea of convergence or the quantification and calculation that makes it possible, *Cycles* is the first of Conrad's projects since *H* to employ digital technology. Introduced in 1967—only a decade before Conrad made *Cycles*—the handheld calculator was one of the first consumer devices to use the miniaturized transistors that enabled computers to shrink from the room-sized boxes of the 1950s to the desktop machines of the "personal computing" revolution. Because of the calculator's starring role in the video, and as Branden W. Joseph points out in this volume, *Cycles* is not simply a video about music, but rather, a video about computer-generated music and by extension computer-generated art. "First and foremost, it is a commentary on computer art and the role of computers in video," Conrad stated in 1991.⁴⁴ With typical humor, he has made "computer art" not by using computer software to make a digital animation—as the pioneers of computer art would have done—but rather by shooting an *analog* video of himself using a digital device to "program" an "animated" sequence of numbers. In this regard, *Cycles* follows *H* in being another ironic response to Harold McIntosh's proposal that Conrad make a computer-animated film. Ultimately, *Cycles* is a pivotal moment in Conrad's body of work, continuing his filmic exploration of the convergence of sound and image even as it anticipates a future in which digital technologies will make the distinctions between sound and image—and the storage formats of film and video—obsolete. Further, it emphasizes the idea that digital art is not necessarily art made with computers—or, more precisely, not necessarily art made with computers in the typical sense. Rather, it can be alternatively defined as art produced through the calculation of quantified information.

As Conrad acknowledged, *Cycles* is a parody of digital art—but digital art is not the only target of its critique. Strategically, the video eschews the techno-utopianism associated

with much early digital work. As Conrad proudly noted, the video performs "a kind of nose-thumbing" in "using a five dollar hand calculator as a computer video tool":

I wanted to use a hand calculator as sort of a retro computer, like the way you might deliberately use a paper airplane instead of a jet if you want to mock something you feel is inappropriate in the military—the overwhelming military budget. You might say, "Fuck you, I can make an airplane for 15 cents."⁴⁵

In other words, *Cycles* is a rejection of the high-tech wizardry favored by some video art pioneers, such as Nam June Paik, who relied on sophisticated analog video synthesizers to create spectacular editing effects. In contrast, Conrad adopts digital technology only in its most humble, quotidian form and uses it to produce a black-and-white, static-frame video. He thereby belies the popular conception of computers as powerful, even mystical devices shaping the future, offering instead a vision of computing as something that is prosaic, routinized, even boring. Thus Conrad debunks what he called the "almost erotically driven fantasy of control and sophistication" motivating other artists' desires to deploy "the most lavishly endowed computer possible."⁴⁶ The way in which he uses his technology also aims to undermine it: the abstract mathematical principles and unerring operations of Conrad's calculator are frequently frustrated by his own user errors, including pressing the wrong button and changing his mind about what he wants to do next. Rather than a panacea, computing here is presented as just another technology subject to the desires and fallibility of its human operators. By challenging the fetishization of digital devices and underscoring the contingency of their operations, *Cycles* works through what Conrad calls "questions of the legitimacy or the effectiveness of . . . computer music, computer art, and the utility of the computer as a tool in artistic applications."⁴⁷

Conrad's skepticism regarding digital technology, as manifested in *Cycles of 3s and 7s*, was ultimately part of a much larger project of calling into question the rational principles on which technology is premised. By his account, it was after completing *Articulation of Boolean Algebra for Film Opticals* and just before beginning work on *Cycles* that he came to view the use of Boolean logic, and mathematical systems more generally, with suspicion. As he explained:

The combinatorial principle, I realized, had bred itself in me without critical consideration and oversight, a naive-rationalistic holdover from earlier in life

having been charmed by mathematical symmetry, elegance, and closure. This realization not only reached back to contaminate earlier work (like *The Flicker*) with suspicion; more significantly, it may be seen as laying the ground for a lot of my thinking during the following several decades. . . . In fact, much of my ongoing work has targeted these bulwarks of artistic rationalism.⁴⁸

As he would expound elsewhere, the “rationalism” that is encoded in Western idealism and exemplified by the Pythagorean principles of Western music is far from neutral: “One might say that the whole Pythagorean construct . . . was elaborated in philosophical and ideological opposition to the democracy movement and has served the interests of the hierarchy for several millennia,” he argued.⁴⁹ Bookended by *H* in 1965 and *Cycles of 3s and 7s* in 1977—both of which use digital technologies to defy the conventional boundaries of artistic mediums—Conrad’s major films of the 1960s and 1970s reveal an artist experimenting with the digital imaginary. Seen through the lens of his subsequent works, they also reveal an artist coming to terms with the philosophical and ethical ramifications of understanding beauty or truth as things that can be quantified and calculated, or that should conform to an *a priori* ideal. In this moment, Conrad modeled an artistic practice that deployed new technologies while interrogating their built-in principles and aesthetic repercussions, pioneering a trail for subsequent generations of artists.

This was a responsibility that Conrad, a committed mentor and educator, took seriously. In the 1980s, Conrad began to think about digital technology in explicitly social and political terms, which filtered into his work as a professor. In 1984, when digital art was entering the curriculum at the Center for Media Study (later the Department of Media Study) at the University at Buffalo, Conrad wrote a kind of white paper for his peers, entitled “Opening Our Eyes and Selves: The Importance of the Case Against Digital Arts.” Throughout its seven pages, he warns against the fetishization of computers in the arts, questions the utility of the computer as an artistic medium, worries over the computer’s imbrication with “the concerns of industry at large,” and characterizes the practical education of computer programmers as inherently at odds with the humanist education of artists—even as he acknowledges that computer literacy will become “a factor of basic media literacy, for the citizen of the twenty-first century.”⁵⁰ Addressing his colleagues, he writes that they must lead their students through the hazards of digital art by example, teaching them how to “remain elevated above

a horizon of limitations imposed by technological systems”—or, in other words, how to think outside the (black) box. His concluding call to arms, entreating his fellow artists to be deliberate in their mapping of the future of digital art, still feels urgent: “An active course in shaping our own response to the current challenges will not only profit us bountifully in times ahead,” he writes, “but will represent a clear voicing of our own authority on questions that must assume increasingly historic significance in coming years.”⁵¹

Notes

1. The events of that evening can be heard on the track “Mario and the Flickering Jewel,” which Conrad later released as part of a compilation of 1960s audio recordings on the 1997 album *Jack Smith: Silent Shadows on Cinemaroc Island—56 Ludlow Street 1962–1964, Volume II*. Table of the Elements AG 47, 1999, CD.
2. Tony Conrad, “Retrospect I,” in *Buffalo Heads: Media Study, Media Practice, Media Pioneers, 1973–1990*, eds. Woody Vasulka and Peter Weibel (Cambridge, MA: MIT Press, 2008), 543. Reproduced on pages 82–91. For another account by Conrad of the origins of *The Flicker*, see Scott MacDonald, “Tony Conrad On the Sixties,” in *A Critical Cinema 5: Interviews with Independent Filmmakers* (Berkeley: University of California Press, 2006), 64–65.
3. Conrad credited the experience of watching *Scotch Tape* paired with its soundtrack for the first time as inaugurating his fascination with the relationship between sound and image. See Brandon W. Joseph, *Beyond the Dream Syndicate: Tony Conrad and the Arts after Cage* (Brooklyn: Zone Books, 2008), 245–48, and MacDonald, “Tony Conrad On the Sixties,” 61.
4. This accounting of Conrad’s early experience with computers is drawn from his “Progress 5” (unpublished digital document), Tony Conrad Archives, Buffalo, New York.
5. Conrad, email to Tim Griffin, August 26, 2015. Tony Conrad Archives, Buffalo, New York. Conrad also recounts the story in his text for the fiftieth anniversary issue of *Artforum*, which was devoted to “art’s new media”: “It was pure luck that I began programming computers in 1960, because nobody knew then what a huge change computers would bring about. In 1961 (just before *Artforum* launched) I was solicited to make an experimental animated film on the IBM 704 computer printer—I was completely uninterested.” Conrad, “Media Study: Tony Conrad,” *Artforum* 51, no. 1 (September 2012): 419.
6. For example, the first exhibition of computer art in America was *Computer-Generated Pictures*, held at the Howard Wise Gallery in New York in April 1965.
7. Conrad quoted in Heather Pesanti, *Wish You Were Here: The Buffalo Avant-Garde in the 1970s* (Buffalo: Albright-Knox Art Gallery, 2012), 47. Conrad stated the same idea differently in an essay for the 2008 catalogue *Buffalo Heads: “Convergence” itself*—as it later came to mean the digital resolution of all cultural information onto a common storage platform—was a virtual target of Woody Vasulka’s efforts to render and modify video images at the pixel level.” Conrad, “Retrospect I,” in Vasulka and Weibel, *Buffalo Heads*, 542. Reproduced on pages 82–91.
8. On the erosion of the notion of the medium by technology and other forces, see Rosalind Krauss, “A Voyage on the North Sea”: *Art in the Age of the Post-Medium Condition* (London: Thames & Hudson, 2000).

9. In 2014, Conrad reconfigured *The Flicker* again, albeit on a less drastic scale, by using a looper to continuously present a 16mm print of the film in the first major solo presentation in the United Kingdom of his work, *Tony Conrad: Invented Acoustical Tools 1969–2014*, held at Inverleith House, Edinburgh, from October 2014 to January 2015.
10. Conrad, “Media Study: Tony Conrad,” 419.
11. On the increasing absurdity of drawing a distinction between “digital” artists and those who work with more traditional media, see Lauren Cornell and Ed Halter, eds., *Mass Effect: Art and the Internet in the Twenty-First Century* (Cambridge, MA: MIT Press/New Museum, 2015). On the paradox of defining digital art by its medium, see Domenico Quaranta, *Beyond New Media Art* (Brescia: Link Editions, 2013).
12. As Conrad recounted, Martin took him to the electronic music studio at New York University. There, he saw electronic music composer Morton Subotnick’s Buchla synthesizer, which inspired Conrad to make his own electromechanical tools. This led him to spend much of the late 1960s “learning basic electronics design” so that he could build devices such as an audio oscillator. Conrad, “Progress 5.” Conrad recounts a similar chain of events in his statement on the *Invented Acoustical Tools*, reproduced on pages 278–80.
13. See P. Adams Sitney, “Structural Film,” *Film Culture* 47 (Summer 1969): 1–10, and Malcolm LeGrice, *Abstract Film and Beyond* (Cambridge, MA: MIT Press, 1977). See also Brandon W. Joseph’s important discussion of *The Flicker*’s relationship to a counterhegemonic biopolitics, which suggests the film’s connection to Conrad’s many subsequent works about power and control, such as *Panopticon*, 1988 (fig. 13), and *WIP*, 2013 (fig. 104). Joseph, *Beyond the Dream Syndicate*, 279–352.
14. MacDonald, “Tony Conrad On the Sixties,” 65. Conrad offers a similar explanation in “Retrospect I,” in Vasulka and Weibel, *Buffalo Heads*, 543. Reproduced on pages 82–91.
15. Even the physical process by which Conrad created *The Flicker* relates to his background in music. When Conrad began splicing together the black and white frames (which he made by shooting with the lens cap on and shooting a white piece of paper on a wall, respectively), he drew on his earlier experience with cutting and splicing audio tape. MacDonald, “Tony Conrad On the Sixties,” 66.
16. “Tony Conrad on *The Flicker*” (from a letter to Henry Romney dated November 11, 1965), *Film Culture* 41 (Summer 1966): 1. That said, Conrad would repeatedly aver that *The Flicker* ultimately proved that it was not possible to create visual equivalents of specific harmonic effects.
17. More specifically, *The Flicker* employs a spectrum from six “flickers” per second, below which the light is perceived to simply turn on and off, up to forty flickers per second, which is the just above the standard 24fps speed of film projection.
18. MacDonald, “Tony Conrad On the Sixties,” 70.
19. Conrad, “Progress 5.”
20. MacDonald, “Tony Conrad On the Sixties,” 66, 73.
21. By seeking a static image that would represent the film’s overall composition, Mekas seems to have anticipated the identification of *The Flicker* as an exemplar of structural film’s interest in “shape” instead of narrative, in a manner analogous to minimal sculpture—an identification Conrad usually resisted. For example, in 2003, Conrad wrote that “*The Flicker* was to function less as an ‘anti-film’ film, and more as an ‘anti-art’ film. Instead, it became a flagship of the newly launched ‘structural film’ movement. Whereas I had never regarded the absence of images in the film as having much value in and of itself, since the minimal sculpture movement had emerged several years earlier among artists (or rather

- ‘composers’—Walter De Maria and Robert Morris, in particular) well known to me through their participation in the Fluxus milieu, this abstention from the image was touted among the structuralist film critics as a coup.” Conrad, “Progress 1” (unpublished digital document, July 2003 draft), Tony Conrad Archives, Buffalo, New York. On the relationship of *The Flicker* to the discourse of structural film, and on Conrad’s evolving response to the identification of *The Flicker* as a structural film, see Joseph, *Beyond the Dream Syndicate*, especially 291–304.
22. Conrad, description of *Four Square* (typed manuscript, undated), Tony Conrad Archives, Buffalo, New York, folder TC 940. Notably, while the soundtrack for *Straight and Narrow* is drawn from the album *Church of Anthrax* by John Cale and Terry Riley, the soundtrack for *Four Square* is a song Conrad titled “Emergency Landing,” which he produced using optically programmed envelope generators—foreshadowing the technical interplay of sound and image in his work. Conrad, flyer for a screening of his “Rare Formal Films which Explore and Document Space” at Point Blank, New York, December 11, 1983 (digital document), Tony Conrad Archives, Buffalo, New York.
23. For more on Conrad’s travels in Europe in 1972 in relation to his filmmaking, see Brandon W. Joseph, *The Roh and the Cooked: Tony Conrad and Beverly Grant in Europe* (Berlin: August Verlag, 2012).
24. The first two quotations are from Conrad, “Is This Penny Ante or a High Stakes Game? An Interventionist Approach to Experimental Filmmaking,” *Millennium Film Journal* 43/44—*Paracinema/Performance* (Summer/Fall 2005): 103, reproduced on page 170. The third is from a photo caption in Conrad, “Retrospect I,” in Vasulka and Weibel, *Buffalo Heads*, 546.
25. Conrad, “Retrospect I,” in Vasulka and Weibel, *Buffalo Heads*, 544. Reproduced on pages 82–91.
26. The description of the film here and that follows is summarized from Conrad, “Retrospect I,” in Vasulka and Weibel, *Buffalo Heads*, 544–547. Reproduced on pages 82–91. Notably, Conrad was not the only one to connect flickering light to binary code: in a 1966 interview with Jonas Mekas, the painter Steve Durkee, a member of the psychedelic intermedia collective USCO, explained that strobe light, which pulses off and on, is “the digital trip.” Mekas, “June 16, 1966: More on Strobe Light and Intermedia,” in *Movie Journal: The Rise of a New American Cinema, 1959–1971* (New York: Collier Books, 1972), 245. In his own interview with Mekas that same year, Conrad himself mentioned USCO’s flickering light environment for the discotheque *The World*. While working on *The Flicker*, Conrad “knew that stroboscopic light had been used effectively in the productions of rock ‘n’ roll, like, for instance, what was done by Murray the K in Brooklyn [at *The World*], two years ago. But it seemed to me that nobody had ever taken this in any other way than as an effect in conjunction with something else, and I had always seen it as fantastically beautiful in itself. I wanted to develop it further.” Mekas, “March 24, 1966: An Interview with Tony Conrad: On the Flickering Cinema of Pure Light,” in *Movie Journal*, 230. Conrad also discusses *The World* in a 1966 interview with Tony Musman, reproduced on pages 77–81.
27. Conrad, “Retrospect I,” in Vasulka and Weibel, *Buffalo Heads*, 547. Reproduced on pages 82–91.
28. Conrad, “Sound and Image” (unpublished digital document, introduction to a screening at the sonic.focus conference, Brown University, November 4, 2006), Tony Conrad Archives, Buffalo, New York.
29. Conrad, “Sound and Image.”
30. Richard McGuinness, “Something to Blink At,” *Soho Weekly News* (December 11, 1975): 34.
31. Conrad, “Sound and Image.”
32. Conrad, “Retrospect II,” in Vasulka and Weibel, *Buffalo Heads*, 560.

33. Conrad, "Retrospect I," in Vasulka and Weibel, *Buffalo Heads*, 545. Reproduced on pages 82-91.
34. Given that video was then a new medium, it may be productive to consider that many media theorists from Walter Benjamin onward have noted that the introduction of newer technologies seems to prompt a reevaluation of older technologies. See Benjamin's famous 1930s essay "The Work of Art in the Age of Its Technological Reproducibility (First Version)," trans. Michael W. Jennings, *Grey Room* 39 (Spring 2010): 11-37; Marshall McLuhan, *Understanding Media: The Extensions of Man* (Cambridge, MA: MIT Press, 1994 [1964]); and Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 2000).
35. MacDonald, "Tony Conrad On the Sixties," 74.
36. As Branden W. Joseph argues, there is more at stake in *The Eye of Count Flickerstein* than simply the distinction between medium formats: in the tension between its "minimal" content and the more theatrical content that was cut from the final version, the work figures "an opposition of two distinct socioeconomic regimes: restricted and general economy." Joseph, *Beyond the Dream Syndicate*, 323.
37. Conrad similarly explores the near-simultaneity of broadcast television in his work *Bryant Park Moratorium Rally*, 2012 (recorded 1969). For more on this topic, see pages 108-23.
38. As is always the case in Conrad's work, *Film Feedback* can be connected to multiple bodies of his work on multiple levels: for example, the film itself is 3M 150, the same brand Conrad used in his early pickled films (fig. 79), and the recursive looping mimics the looping of audio tape in his "Three Loops for Performers and Tape Recorders," 1961. Not coincidentally, the looping of audio tape is one of the signature techniques of minimal music, associated with the "time-lag accumulator" designed by Conrad's friend, the composer Terry Riley, but which was also pioneered by Conrad.
39. The unique way in which video feedback allows for the bracketing of a subject between the video camera and a monitor, which Rosalind Krauss famously identified as the essence of video as early as 1976, appears as a motif in several of Conrad's videos, including *Ipsa Facto*, 1985 (fig. 115). For more on video feedback, see Rosalind Krauss, "Video: The Aesthetics of Narcissism," *October* 1 (Spring 1976): 50-64; and David Joselit, *Feedback: Television Against Democracy* (Cambridge, MA: MIT Press, 2007).
40. One assumes Conrad had read Walter Benjamin's famous meditation on the impact of reproduction on the aura of the work of art, "The Work of Art in the Age of Its Technological Reproducibility," which was first published in English in 1968 (see note 34). There is, of course, a substantial body of literature on the relationship between media—especially electronic media—and haunting, from the work of Jacques Derrida to Friedrich Kittler and Jeffrey Sconce.
41. For more on Conrad's pedagogy, see pages 58-63.
42. See, for example, Alan Licht, "A No-Lose Strategy: Tony Conrad on His Music, 1989," in *Blank Forms 2* (2018): 21.
43. Not coincidentally, the calculations themselves, as Conrad narrates them, have a musical quality. He later admitted to having "organized the calculations to reflect [the] familiar musical structure of verse and chorus, and coda and intro." Conrad, interview with Chris Hill, March 17, 1995, <http://www.vasulka.org/archive/Contributors/ChrisHill/InterviewTonyConrad.pdf>.
44. Conrad, notes on *Authorized to Surrender: A Video Retrospective* (1991), Tony Conrad Archives, Buffalo, New York.
45. Licht, "A No-Lose Strategy," 21.
46. Conrad, interview with Hill.
47. Conrad, interview with Hill.

48. Conrad, "Retrospect I," in Vasulka and Weibel, *Buffalo Heads*, 547. Reproduced on pages 82-91.
49. Conrad, "Sound and Image."
50. Conrad, "Opening Our Eyes and Selves: The Importance of the Case Against Digital Arts" (unpublished manuscript, April 10, 1984), 2, <http://www.vasulka.org/archive/Artists1/Conrad,Tony/OpeningEyes.pdf>.
51. Conrad, "Opening Our Eyes and Selves," 7.

An Interview with Tony Conrad / Toby Mussman (1966, Excerpts)

Toby Mussman: Could you provide some background—like your age, college, and major and how long you've been in New York?

Tony Conrad: I've been in New York now three-and-a-half years: graduated from Harvard four years ago with a major in math before which time I had the opportunity to spend a year traveling in Europe. I'm thirty seconds old. Since I've been here, most of what I've been involved in has been in the field of music, and a lot of this has been in connection with film, primarily in association with Jack Smith and Ron Rice.

TM: For which films exactly did you do music?

TC: *Flaming Creatures*, *Normal Love*, and *Chumlum*.

TM: What about your work in music alone?

TC: The most expansive adventures have been in working with La Monte Young, with whom I've worked for about three years now on practically a daily basis.

TM: What filmmakers or particular films have you been attracted to or perhaps influenced by?

TC: Well, of course, I've been strongly influenced by the filmmakers that I've worked with.

TM: How about commercial movies?

TC: In connection with the work that I'm doing at the present time it would be irreverent to say that I've been influenced by any particular trend in commercial filmmaking. However, there are certain commercial films that have attracted me by their style and the density of their content. I would pick out among these as especially eventful *Zazie dans le Métro*, which affected my views about filmmaking tremendously. But I would say in connection with what I'm attempting to do right now, more than being influenced by the techniques of commercial films, I'm influenced by artistic trends that I've found myself directly involved in. In film, I've been very much impressed by the work of Jack and Ron, and of course, my work in music with La Monte. In working with La Monte, we have shared a tremendous number of ideas that have naturally affected my attitude to any creative process that I would go through. For instance in the score for *Chumlum*, my role was primarily in an advisory capacity in that I provided the instrumentation, and the performer: the legendary atmospherist Angus MacLise, who has also worked with La Monte and with whom I felt a great artistic empathy. I find that a lot of the stylistic elements I'm interested in are spectacularly absent in commercial cinema