

The Invention of Glitch Video: *Digital TV Dinner* (1978)

Michael Betancourt

In 2009, a short video from 1978 titled “Digital TV Dinner” was posted on *YouTube* by Jamie Fenton, who made it with Raul Zaritsky; Dick Ainsworth created the music.¹ Both Fenton and Zaritsky were part of the video art community around Chicago, Illinois in the late 1970s, and this video was originally produced for “Electronic Visualization Event #3” organized by Dan Sandin and Tom DeFanti’s *Electronic Visualization Laboratory* in Chicago (May, 1978).² It was part of a program of works prepared in advance, and screened in a 500-seat theater using a high-intensity GE video projector.³ A second version was later broadcast in March 1979 on the WTTW program *Image Union* that highlighted local video and film.⁴ The importance of this early work with digital glitches is principally anticipatory: it provides an explicit connection between contemporary developments with digital glitches and the earlier innovations of analog video processing. *Digital TV Dinner* suggests future engagements with the “materiality” of the digital signal as an intervention in the execution of programming code within the computer system itself. Fenton was deeply familiar with the *Bally Astrocade: The Professional Arcade Expandable Computer System* used to create this tape since she was the programmer writing its games at the company where she worked:

“There was ROM memory in the cartridge and ROM memory built into the console. Popping out the cartridge while executing code in the console ROM created garbage references in the stack frames and invalid pointers, which caused the strange patterns to be drawn.”⁵

This implicit, thorough knowledge of the *Astrocade*, coupled with the specific context of its premiere at *Electronic Visualization Event 3* makes this early use of digital glitches less surprising. This type of performative engagement with analog and digital media was common to artists associated with Sandin and DeFanti in Chicago during the 1970s: the idea of “electronic visualization” was *performative*—an active engagement with the media technology—rather than passive, an image to watch,⁶ making this adaptation of it

for use with the new, cheaper home computer a logical extension of the counter cultural opposition to the military-industrial complex emergent in early video art of the 1960s.⁷ This active engagement was a feature of video seeking to provide an alternative to the corporate model broadcasting common to TV where the audience was rendered passive by disparities in technology and access to media production tools.⁸ This context shapes the initial distribution of *Digital TV Dinner* and its later presentation online.

After being posted online in 2009, this video was rapidly adopted by contemporary “glitch artists” as an early exemplar of visuals produced under the catch-all name “glitch.” The extent of this video’s embrace and recognition by “glitch artists” is immediately apparent from its common presence on websites associated with glitch art, but in spite of this general reposting and mention-citation, there is almost no information, history, or discussion of it available beyond the quotation of the *YouTube* descriptive text; it is a prominent enough early exemplar that it appears in the Wikipedia article on “glitch art,”⁹ but even this discussion provides no additional information about the work not already contained by the original 2009 posting itself.

The early date of this tape, coupled with the approach to creating its visuals (described in a voice-over attributed to Tom DeFanti, but which is uncredited on the tape) make it one of the first, if not the *very first* “glitch” video.¹⁰ Its production technique is an exploit of a problem with the *Astrocade*. Cartridges stuck into the console would “pop” out if you struck the case, creating the anomalous digital imagery; the video included an experimental music track created with a variation on this same exploit. Typical for home computer games in the 1970s, the *Astrocade* attached to a TV set through its antenna connection, enabling its output to be readily recorded by connecting it to a VTR instead. The description of the version of *Digital TV Dinner* provided on *YouTube* provided technical details about its initial production, but not all of this information in this posting is completely accurate:

Digital TV Dinner is a video art clip from 1979 created by Raul Zaritsky, Jamie Fenton, and Dick Ainsworth using the *Bally Astrocade* console game to generate unusual patterns.

The *Bally Astrocade* was unique among cartridge games in that it was designed to allow users to change game cartridges with power-on.

When pressing the reset button, it was possible to remove the cartridge from the system and induce various memory dump pattern sequences. *Digital TV Dinner* is a collection of these curious states of silicon epilepsy set to music composed and generated upon this same platform.

DTV first appeared at an Electronic Visualization Festival in Chicago, and we hear the voice of Dr. Thomas DeFanti introducing this item to the audience.¹¹

In an emailed response to an earlier draft of this essay, Fenton expanded on the information posted with the *YouTube* video about the technical details of transferring the *Astrocade* video game systems' output to videotape:

There were two unique aspects of the *Astrocade* that made *DTVD* possible. First, the video was legal NTSC so it could be recorded. None of the other game consoles was. Second, as you note, you could change cartridges with the power turned on. All of our competitors made you power-down before changing carts.¹²

The computer game systems available in the 1970s, such as the *Atari 2600 Video Computer System* game console, separated their graphics into entirely different fields for each 'frame' of the video.¹³ This meant that each frame showed two different images, making recording them to tape difficult without hardware (such as a time base corrector) to fix these inherent problems with the NTSC video signal. The use of standard NTSC video as the output for the *Bally Astrocade* meant it was a system uniquely suited for this type of graphic experimentation with its digitally-generated output.

The description posted with *YouTube* video implies it is the same as the version shown at the festival; however, this video is not the same one included in the *Electronic Visualization Event 3 Distribution Tape* from the May 1978 event (the "Electronic Visualization Festival" mentioned in the description). The differences between these versions are subtle, and do not change the substance of the video itself: the original *Digital TV Dinner* on the *EVE3* tape has only a simple shot of a typed label [Figure 1] that provides credits for the piece; there is no voice-over or other explanation of the tape. The version posted on *YouTube* is *not* this original, first version shown in 1978. It is a variation on what is essentially the same tape, but this second version adds a voice-over

attributed to Tom DeFanti that explains how the video was produced. It also adds two title cards: the first at the head states “Digital TV Dinner Jay Fenton Raul Zaritsky” [Figure 2] and an end card stating “Audio by Dick Ainsworth” [Figure 3]. This second version is identical to the *Digital TV Dinner* broadcast on *Image Union*. This episode focused on animation and included a variety of other digital productions where Fenton collaborated with other video artists. The only differences between these two versions of *Digital TV Dinner* are in the titling and the added voice-over narration.

The *Electronic Visualization Event 3 Distribution Tape* runs 60 minutes and contains a variety of video works; however, the approaches and techniques on display are quite disparate, and the videos are all examples of “visual music” made as video art. It is a typical example of the “Chicago school” of video in the 1970s, where the tapes are simultaneously demonstrations of new techniques, and organized musically in ways that develop from the earlier history of visual music film animation. Of the 8 videos in the collection, *Digital TV Dinner* is the only work where either Fenton or Zaritsky is credited. In reviewing this “distribution tape,” their digital video is clearly produced using an entirely different technique unlike anything else on the tape—even though some of the other pieces do resemble computer art, *Digital TV Dinner* is utterly unlike them in its imagery. These differences make the piece seem anomalous in context with other video art productions from *Electronic Visualization Event 3*, all of which have a similar aesthetic of kinetic forms suspended in a black space; several of them employ signal processing suggesting their production involved Sandin’s *Image Processor*.

The *Electronic Visualization Laboratory*, founded in 1973, was devoted to interdisciplinary work—specifically the exploration and development of computer imaging as it intersected with video art.¹⁴ Sheldon Brown, Director of the Center for Research in Computing and the Arts at the University of California, San Diego described these experiments in his introduction to a survey of Sandin and DeFanti’s collaborations in 2011:

This work has more in common with some threads of avant-garde conversations in art film deriving from poetry and painting than it did with emerging video art growing from conceptual art, performance art and cultural theory. The work of Sandin and collaborators could occasionally

be heard characterized as “video wallpaper,” but its reach was already influential to other pioneering figures such as Nam June Paik and the Vasulkas.¹⁵

Those “threads” of avant-garde film Brown describes are visible as the history of abstract film, that genre of production known as “visual music.” These works tended to be oriented towards visual forms that suggested hallucinatory states and synaesthesia; it is a history in avant-garde film that converges on that of abstract painting in form, meaning and aspiration. Hallucinatory states provided inspiration and a direct referent for the synaesthetic imagery used by some of these artists; Fenton, in the same email exchange about this essay, explained her inspiration for *Digital TV Dinner* in precisely these *psychedelic* terms:

One weekend I was tripping on a drug called ALD-52 (which is like LSD), with some friends. At dinner time, I was playing around with the *Bally Arcade* by popping out the cartridge during the boot-up sequence and saw the machine go into a particularly complex glitch animation sequence. It occurred to me that the machine was “tripping” just like I was. Later, with a video recorder connected, I tried to recreate that experience. I was never able to get it into the extended animation that I saw earlier. Instead we cut together several glitches into the tape we later showed at the festival.

So glitches begat glitches and dinner begat dinner.¹⁶

[...]

Raul and Dick were not partying with me when I “discovered” *DTVD*. Raul did the video editing and Dick did the sound track. Dick wrote the manual for a program I created called “Bally Basic,” which for a few months held the title of “cheapest computer you could program yourself.”¹⁷

The relationship Fenton describes between a personal, subjective experience and the formal organization of imagery for a finished work is a common part of the visual music tradition’s heritage. This subjectivist dimension also found application in the kinds of transformations Sandin’s *Image Processor* could produce—both as an analog machine, and as a analog-digital hybrid (by the mid-1970s, Sandin and DeFanti employed a PDP-

11 computer for precise control of its effects¹⁸). These transformations have become a standard part of the visual language of media art generally, as Brown notes:

Bit-depth, gamma range, object edges and noise were some of the new compositional elements that analog and digital signal processing made apparent. Over the following decades this new semantics permeated image culture at large, becoming the *de facto* material basis by which media is produced.¹⁹

Brown's analysis suggests the transformative effect of Sandin's IP on analog video can be understood in a *materialist* sense: that the electronic video signal is the "real" video, its display simply a translation of those encoded instructions into tangible form shown on a monitor/TV, or via projection. The kinds of engagement that this approach offers for electronic and digital systems enables the recognition of how works like *Digital TV Dinner* offer a direct parallel those avant-garde films made by scratching the film stock, direct animations that hand-paint their imagery without a camera, or photogram and collage techniques—such as in Man Ray's *Retour à la raison* (1923), or Stan Brakhage's *Mothlight* (1961) made without photography. Fenton's manipulations of the digital computer as an instrumental performance are akin to music, and like music, are dependent on the virtuosity of the performer—for the same reasons. *Digital TV Dinner* participates and reflects this very specific conceptual and aesthetic context both in its form—it is a visualized performance—and in the meaning those forms have as visual accompaniment to the music (as a work of video art in a "visual music" mode).

The version of *Digital TV Dinner* posted on *YouTube* in 2009 is identical to the second version of the tape, which was shown in *Image Union* episode 11 broadcast on March 20, 1979. That the program was from 1979, rather than 1978, makes it a likely source for this digitized version, and accounts for the discrepancy in dating (1978/1979). *Image Union* aired on WTTW, the public television station in Chicago, because, unlike similar programs produced to air on "access channels" provided by CableTV in other cities such as New York where CableTV was introduced in the early 1970s (along side the introduction of portable video recording equipment), CableTV did not arrive in Chicago until the 1980s.²⁰ This difference impacted the development of what Michael Shamberg termed "Guerrilla Television" in his book of the same name:

Guerrilla Television is grassroots television. It works with people, not up from above them. On a simple level, this is no more than “do-it-yourself-TV.” But the context for that notion is that survival in an information environment demands information tools.²¹

The opposition to broadcast TV is an explicit part of this approach to media production/distribution, but in the Chicago area, the difficulty of distribution—provided by the cable access channel elsewhere—necessitated a compromise. WTTW’s first series featuring independent video productions, *Nightwatch*, hosted by Gene Siskel as a call-in show where the programs were secondary to his celebrity presence was replaced by *Image Union*. Organized by Tom Weinberg, who was part of the TVTV video collective, it initially drew from his connections with the local video community and work made at the *Chicago Editing Center* that provided access to video production tools.²² *Image Union* thus reflects the interests and concerns of *Guerrilla Television*, even though it aired on PBS. The program was a 60-minute long anthology of tapes and films produced in the Chicago area, broken into two 30-minute sections. In episode 11 the first half hour includes TV commercials, logos for industrial companies, student animations, and political anti-capitalism cartoons; the second half shows computer-generated video. The diversity of this first half shows a vibrant, dynamic media community where artistic, commercial, and scientific interests overlapped in an interdisciplinary fashion. The variety of materials on display closely mirrors the mixture of avant-garde and commercial works in the popular-oriented film exhibitions of the 1940s-1960s such as Frank Stauffacher’s *Art in Cinema* (1946-54).²³ *Digital TV Dinner* headlines the second half of the show, what a voice-over on the interstitial credits for *Image Union* describes as “videotapes by Chicago computer image video artists.” This collection of (mostly) abstract videos were all made with digital systems, and it documents the relationship between these early digital imaging systems and earlier analog video.

It is the first of a series of videos in this episode made by Fenton; in fact all of the computer videos except one (*Electronic Boogie* by Bob Snyder) credit Fenton as either the lead artist or as collaborator. *Image Union* presents her use of the game system as a creative tool, offering it as a model (and system) for artistic experimentation in a variety of different ways. However, even in context with a number of other computer works by

Fenton, *Digital TV Dinner* is unusual: unlike the next video, *Grafix* by Fenton, Nola Donato, and Tom DeFanti, which demos a software designed to use the Bally home computer game hardware, *Digital TV Dinner* is *not* a use of software—it is an exploit of technical failure. The imagery appearing in this video is *not* designed. Instead, it emerges spontaneously as the processor memory faults when the game cartridge is prematurely removed from the console. These images are a result of the digital processor glitching *after* the program being run is unexpectedly interrupted.

Image Union's episode on experimental animation by Chicagoans documents developments dependent on the historical shift emerging from the micro computer's introduction in 1974. That most of this program shows works designed for the microcomputer is a reflection of the *Guerilla Television* concern with accessibility to production tools; the position of *Digital TV Dinner* at the beginning of the second half, along with the explanatory voice-over, applies this democratic concern to the emergent possibilities of the digital computer. All the digital video works in this episode were produced with *home* computers—unlike the much more expensive-to-produce computer films of earlier in the 1970s (by Stan VanDerBeek, Lillian Schwartz at Bell Labs, or John Whitney at IBM, for example, or Sandin and DeFanti's own use of the PDP-11 to control the *Image Processor*) that were much more difficult to produce, and consequently required corporate or institutional support. These cheaper machines were readily accessible, opening up access beyond the limits of corporate/institutional control.

The *Digital TV Dinner* video is the only one shown that was not made by writing a program specifically to generate its imagery. Tom DeFanti's voice-over narration (uncredited on the tape) opens the second version, speaking over the credits and into the start of the video itself, making the differences in how it was produced a part of the tape:

“This piece represents the absolute cheapest one can go in home computer art. This involves taking a \$300 video game system, pounding it with your fist so the cartridge pops out while its trying to write the menu.

“The music here is done by Dick Ainsworth using the same system, but pounding it with your fingers instead of your fist.”

The process DeFanti describes for the creation of this audio-visual work is one that

emphasizes the performative over (and against) the explicitly programmed. It necessarily contains an element of uncertainty about the result, even though an experienced and well-practiced performer would likely know approximately what the results would be: these images are an interruption in a technical protocol that is entirely predictable in a strictly determinate fashion, even if in practice, the results are less so. The stoppages inherent to this process reveal a digital failure resulting from the unintelligent mechanical protocol proceeding normally. The imagery appearing on screen reflects a stoppage of this typically proceeding sequence—creating visuals that reflect a partial implementation of the instructions contained by the digital code. Because the performance—the human initiated “stoppage” of the computational process—creates ‘unanticipated imagery,’ each interruption at the same point would produce identical results—these constants are the *mechanical* nature of the generated imagery. The inclusion of *Digital TV Dinner* opens the use of digital technology to non-programmers in an ironic fashion: the violent interruption (“pounding it with your fist”) becomes a productive action, not simply smashing the system. It reclaims the Luddite’s gesture of sabotage as a creative and productive activity.

This approach is the same engagement with the materiality of digital technology that has an analogue in the earlier materiality of both film (dirt, flicker, grain, scratches, etc.) and video (signal decay, interlacing, ghosting, etc.). The transfer of this engagement to digital technology parallels the material concern David Antin described in “Video: the Distinctive Features of the Medium.”²⁴ In practice, causing a stoppage at *exactly* the same instant in the code’s execution is problematic, giving the results their unanticipated-yet-predictable character. Individual “shots” (stoppages) have a high degree of self-similarity, but are nevertheless distinguishable as unique instances of the same underlying glitch technique applied to the same sequence of instructions.

The foundation of this glitch in the graphics system of the *Astrocade* itself is confirmed through even a cursory comparison to other graphics produced with the same system, but as the coded, expected results of normal operation. The flat geometric forms appearing during the title and introductory voice-over in the *Grafix* demo tape that follows *Digital TV Dinner* in the *Image Union* program from 1979 demonstrates this similarity: the *Grafix* tape shows software created for the same technology as employed

in the *Astrocade* game. While the title card for *Grafix* is abstract, [Figure 3] and presents highly graphic geometric forms in motion, the rest of the video is more typical of consumer “computer art” systems being created in the late 1970s and early 1980s. The tape demonstrates several simple art programs: one for painting, another for music, including showing how simple the coding for them is. The educational potentials of this software are the focus of the *Grafix* video, showing that the digital computer has potential as an artistic tool. The relationship between the visuals created by the (art) *Digital TV Dinner* tape and this documentary tape is only apparent in the expressive graphics appearing at the start for the title, rather than the less dynamic, documentary footage showing both the software code and what it looks then when in use. Both videos present different engagements with the computer—a “destructive” gesture that violates the system and a “constructive” one that converges on traditional art: what the “paint” program creates is a landscape recognizable as a digital analogue to TV painter Bob Ross’s work.

An offhand comment during this documentary about the Bally *Astrocade* defaulting to the video game “*Gunfight*” when it reboots after crashing illuminates the final glitched image showing “GAME OVER” at the end of *Digital TV Dinner* [Figure 5]. It is possible this image reflects such a system reboot into the game, rather than into the game selection menu, although selecting a game and then glitching it could produce the same imagery. While it is unclear if any of the other imagery shown is also from a game, the tape does contain images that are produced from the glitched boot screen, making more sources than just the menu screen very likely.

However, the selection screen (menu) appears in varying degrees of dissolution throughout this video, and occasionally in a legible, nearly unglitched form. It is possible to read the list of games available on some of these screens. This list changes, suggesting the tape is made from either several cartridges, or several different consoles: *Gunfight*, *Checkmate*, *Calculator* and *Scribbling* are all briefly on screen near the video’s end [Figure 6]. The “Game Over” graphic and music that concludes this piece was used by games on the *Astrocade* such as *Gunfight* [Figure 7]. Its presence is an acknowledgement of the performative aspects not only of its games, but the actions required to produce these broken graphics and music seen and heard throughout the video: this is a document

of someone physically manipulating the machinery itself. What appears has a physical origin, it is not an execution of code, but the interruption in that code's execution that creates what we see in this video: while the imagery is serially structured in a repeating fashion—simple blocks of graphics repeat across the screen, and the anomalous visuals *do* have a recurring graphic form—the imagery that does appear cannot be predicted or controlled with the same precision that graphics specifically generated by code. This performance-aspect shifts what appears from the realm of programming executed automatically, to the particular touch of the individual handling the machine. That the same technique can produce both the visuals (banging the case with a fist) and sounds (tapping the same case with fingers) heard in *Digital TV Dinner* is an indication of how touch-sensitive this type of glitch-manipulation can be.

The serial graphics so readily apparent from *Digital TV Dinner* have remained a common, formal feature of glitch: repeating imagery, both within individual shots and across the range of shots in the whole video, is typical of the kinds of visual produced in contemporary glitch videos. The formal design of these failures were explicitly noted in Iman Moradi's 2004 discussion *Glitch Aesthetics* as a discrete collection of tendencies: fragmentation, replication/repetition, and linearity.²⁵ All of these forms appear in the failures recorded and used in *Digital TV Dinner*. This description summarizes those distinct features associated with serial structures, suggesting autonomously looping computer code generating a result and then repeating/iterating it as a series of similar patterns across the screen. This video is one of the first to create this type of visual digital glitch and employ it as the primary source material. While this effect is novel, it is anticipated by the use of analog failures by earlier video art produced in the 1960s. Many of the electronic oscillation patterns, transformations of the gamma range, isolation of object edges, and the use of signal noise to transform stable video signals are identified as technical failures in the repair handbooks made by RCA.²⁶

What has been recorded and used in *Digital TV Dinner* is the result of the system *partially* crashing: it dumps the material in memory on screen as kinetic geometric patterns that move both up and down on screen at different rates. The text appearing at the top of the screen “SELECT GAME” at the beginning [Figure 8] reappears sporadically throughout the whole video. It shows at what point the processes generating

the screen have been interrupted: this effect is possible in the Bally system because, as Fenton notes, it was one of the only video game systems where cartridges could be removed from the machine without causing a total system crash. When there is a total crash, the machine must reboot—there is no imagery drawn on screen. Rather than producing a procession of strange, repeating patterns, a reboot would often default into the game *Gunfight*, as Fenton notes during the *Gratrix* video, a fact suggested by the concluding shot where the screen says a glitched version of “GAME OVER” and plays the “you’re dead” music that normally accompanies this screen. It is a humorous *finalé* where it is the computer game that died, rather than the player, an acknowledgement of the violence employed in *Digital TV Dinner’s* production—a smashing of the system. This concluding glitch is an appropriate end to the video—a humorous acknowledgement that when glitches distort and transform the computer screen, they are the ‘death’ of normal function: rebooting will be necessary to start over. Evidence of this necessity is scattered throughout the video. Occasionally a partial boot-screen graphic will appear, showing that the interruption is always on the verge of full system failure [Figure 9].

All the imagery of *Digital TV Dinner* is composed from partial failures: the system breaks, but only so much that the standard, anticipated result does not (entirely) appear. The insertion of human decisions at crucial points (the “stoppage”) in an otherwise autonomous process undermines the independent function of the system in question. A breach in normal function, however visible to the audience, is at the same time *not* a failure of the digital system. System failure is *invisible*, it becomes apparent not through *mis*function, but as *mal*function, a cessation—the digital renders *nothing*. Instead of rebooting, the machine generates visuals following the partial instructions still in memory, dumping the results as the chaotic (but structured) ‘noise’ shown in the finished video. This process repeats for each shot with slight variations in result that reflect differences in timing: the images created by this process are highly sensitive to what point in the generation of the system menu has been interrupted. Thus, the results are utterly predictable, without being fully prescriptive of the result. The balance between predictability and a chaotic, unknown result is a common feature of glitch processes, uniting what happens in this video with more recent developments in manipulating digital artifacts produced by glitches and anomalous function. Stoppage offers a potential for

critical rupture, the innate purpose of Guerrilla Television's challenge to broadcast media generally, through its transfiguration of the commonplace elements of the imagery being glitched, but this change is complicated by an equally potential, immanent recognition that the system is broken, an identification that elides any critical potential by normalizing the glitch as system failure. This dynamic renders glitch ambiguous as a critical process/tool.

About the Author

Michael Betancourt is an artist, theorist and historian. His movies have screened internationally at the *Black Maria Film Festival*, *Art Basel Miami Beach*, *Contemporary Art Ruhr*, *Athens Video Art Festival*, *Festival des Cinemas Differents de Paris*, *Anthology Film Archives*, *Millennium Film Workshop*, the San Francisco Cinematheque's *Crossroads*, and *Experiments in Cinema* among others. His writing complements his movie making. He has been translated into Chinese, French, Greek, Italian, Japanese, Persian, Portuguese, and Spanish, and published in many magazines, including *The Atlantic*, *Make Magazine*, *Millennium Film Journal*, *Leonardo*, *Semiotica*, and *CTheory*. He wrote *The _____ Manifesto*, and more than twenty-one books such as *The Critique of Digital Capitalism*, *The History of Motion Graphics*, and *Beyond Spatial Montage: Windowing*.

FIGURES:

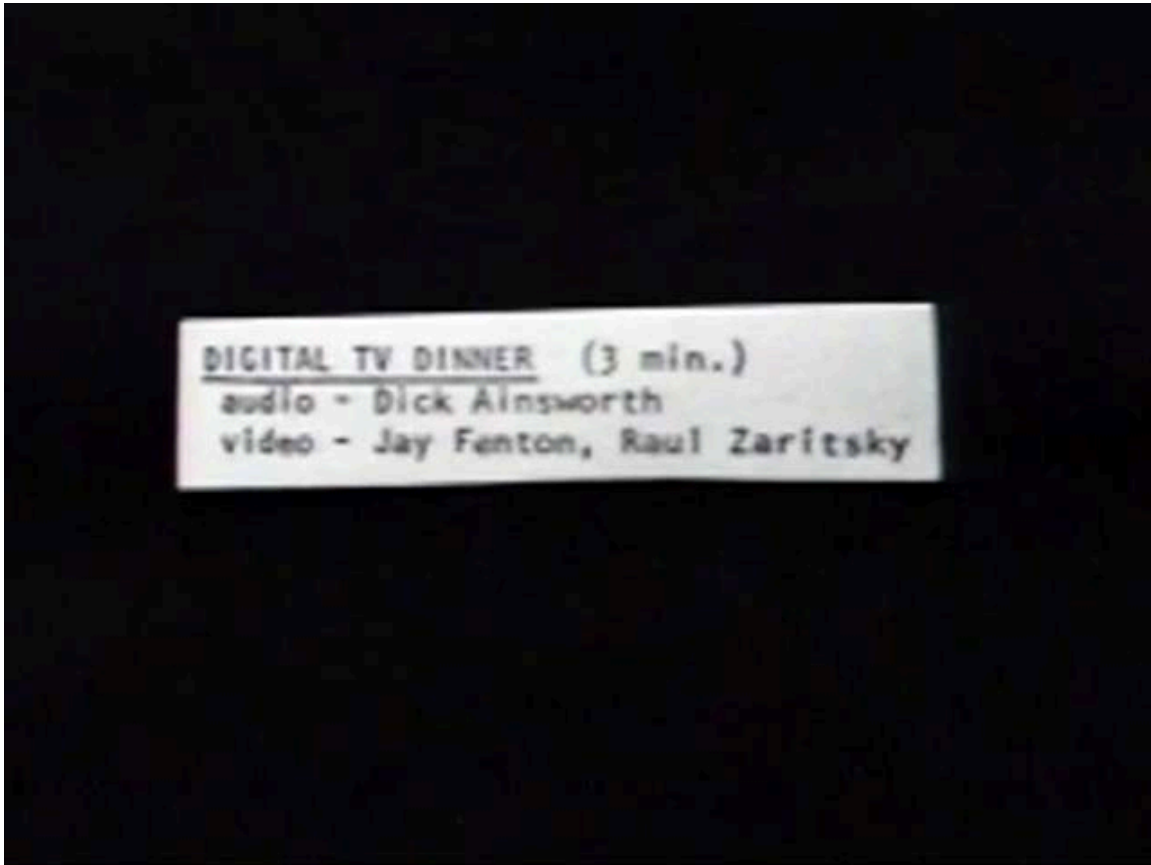


Figure 1: Typed title card, first version of *Digital TV Dinner* shown at *Electronic Visualization Event 3*, May 1978.



Figure 2: Title card from second version of *Digital TV Dinner* broadcast on *Image Union*, March 20, 1979.



Figure 3: End title card from second version, *Image Union*, March 20, 1979.



Figure 4: Title card from *Grafix* video broadcast on *Image Union*, March 20, 1979.



Figure 5: “Game Over” graphic appearing at the end of *Digital TV Dinner*.

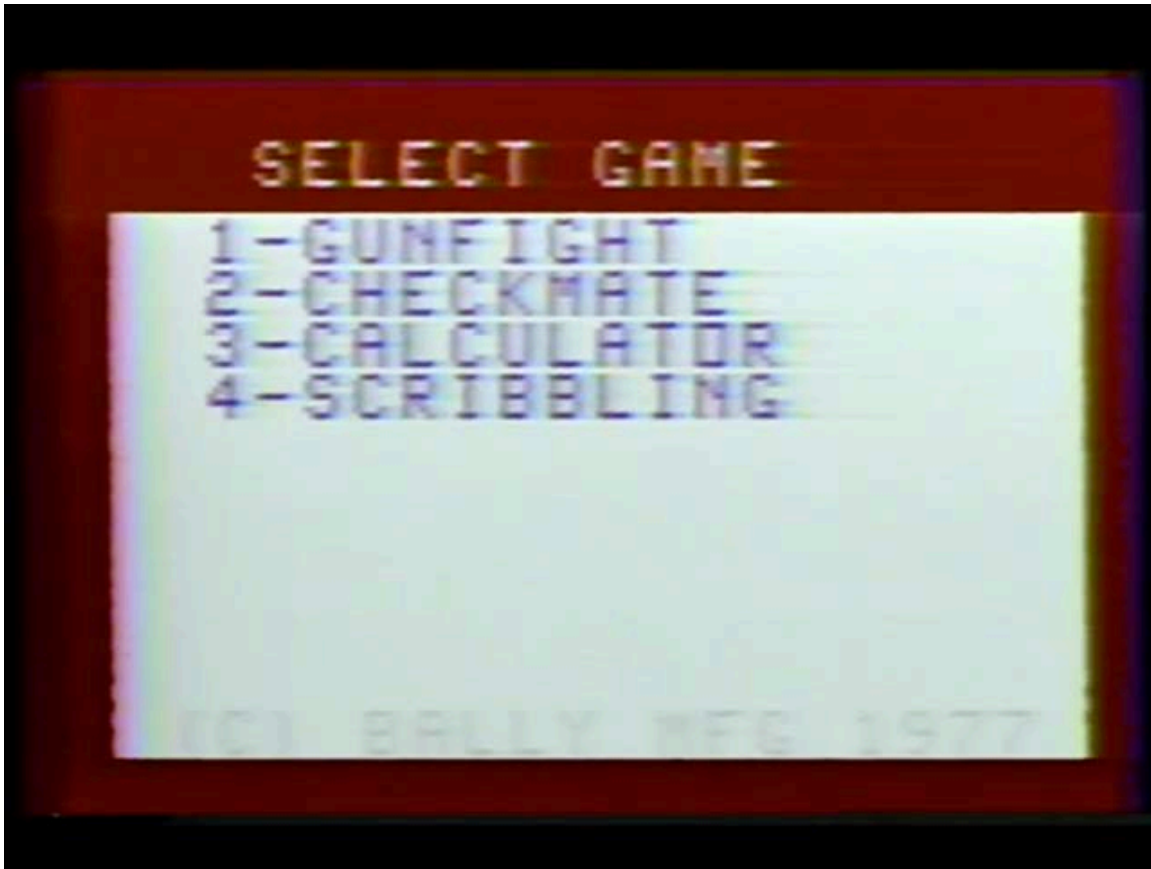


Figure 6: Menu from Bally *Astrocade* game system appearing in *Digital TV Dinner*.



Figure 7: Still from Bally's "Gunfight" game in *Grafix* (1979).

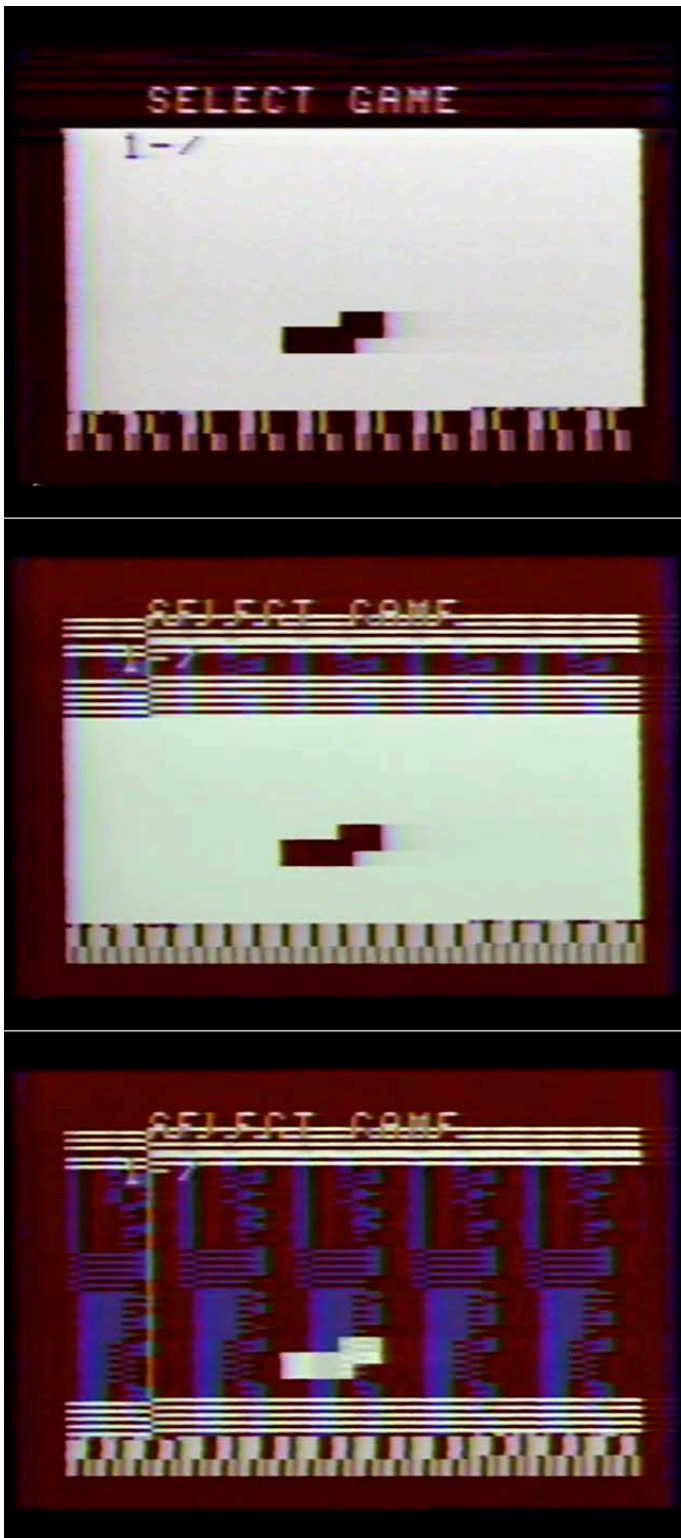


Figure 8: Series of stills showing the progressive glitching of "select game" in *Digital TV Dinner*.



Figure 9: Boot screen logos, Bally *Astrocade* appearing briefly in *Digital TV Dinner*.

¹ *Digital TV Dinner*'s YouTube posting had 3,645 views, and 76 “thumbs-up” approvals by February 4, 2014.

² It appears in the middle of a program of 8 videos: *Wire Trees with 4 Vectors*, (video: Phil Morton, Guenther Tetz, audio: Lief Brush, Stu Pettigrew); *By the Crimson Bands of Cyttorak* (video: Tom DeFanti, Barbara Sykes, audio: Glen Charvat, Doug Lofstrom, Rick Panzer, Jim Teister); *Electronic Masks* (video: Barbara Sykes, audio: Glen Charvat, Doug Lofstrom, Tom Warzecha); *Spiral 3* (video: Tom DeFanti, Phil Morton, Dan Sandin, Jane Veeder, dance: Rylin Harris, audio: Sticks Raboin, Bob Snyder); *Digital TV Dinner* (video: Jay Fenton, Raul Zaritsky, audio: Dick Ainsworth); *Data Bursts in 3 Moves* (video Phil Morton, Guenther Tetz, audio Phil Morton, Bob Snyder); *Cetacean* (video: Chip Dodsworth, Phil Morton, audio: Barry Brosch, Chip Dodsworth); *Not of This Earth* (video: Barbra Latham, John Manning, Ed Rankus, audio: Patti Smith). Listed in Stone, Trish. *Synthesis: Processing and Collaboration*, (San Diego: The Gallery@Calit2: 2011), p. 42.

³ Fox, Tiffany. “Interview with Dan Sandin and Tom DeFanti” in *Synthesis: Processing and Collaboration*, (San Diego: The Gallery@Calit2: 2011), p.13.

⁴ It appears in the second half of *Episode 11: Animation*, starting at timecode 36:36. This original broadcast includes the same voice-over at the start as the version posted to YouTube. The video is available in the Media Burn archive: <http://mediaburn.org/video/image-union-animation-episode-10/> accessed, February 4, 2014.

⁵ “Jamie Fenton,” biography webpage on personal website: <http://www.fentonia.com/bio> accessed, February 4, 2014. Also, the quote is from provided in a private email, February 7, 2015: “I was the lead software engineer on the *Arcade* project. I had 2 engineers helping me. Part of my role was to make sure that the hardware guys created a good design. Jeff Frederiksen was the lead hardware guy—he was and is brilliant (and a little difficult to work with, since he could change a design on a moments

- notice). Right now Jeff is working at Apple on the *iPhone*. All this means I can point-out where in the code things went wrong.”
- ⁶ Youngblood, Gene. “Art and Ontology: Electronic Visualization in Chicago,” in *The Event Horizon* ed. Lorne Falk and Barbara Fischer (Toronto: Coach House Press and The Walter Phillips Gallery, 1987).
- ⁷ Scott, Felicity D. “Networks and Apparatuses circa 1971: Or, Hippies Meet Computers” in *Hippie Modernism: The Struggle for Utopia* (Minneapolis: Walker Art Center, 2015) pp. 108-110.
- ⁸ Shamberg, Michael and Raindance Corporation. “Manual” in *Guerrilla Television* (New York: Holt, 1971).
- ⁹ The text summarized what appeared with the YouTube video: “Early examples of glitches used in media art include *Digital TV Dinner* (1979) created by Raul Zaritsky, Jamie Fenton, and Dick Ainsworth by manipulating the Bally video game console and recording the results on videotape.” https://en.wikipedia.org/wiki/Glitch_art accessed, February 4, 2014.
- ¹⁰ In a private email discussing this essay prior to publication with Jamie Fenton, on February 7, 2014 she notes about the origins of glitches: “The first “glitch art” was seen occasionally when we debugged games in 1975. A game crash would spread “mung,” (or garbage) on the screen. Sometimes the mung had a regularity to it.”
- ¹¹ The second version and its description were uploaded to YouTube on October 8, 2009: <http://www.youtube.com/watch?v=Ad9zdlaRvdM> accessed, February 4, 2014.
- ¹² Private email discussing this essay prior to publication with Jamie Fenton, February 6, 2014.
- ¹³ *Atari 2600 Video Computer System Field Service Manual 2600 / 2600A Domestic (M/N) FD100133, Rev. 02* (Sunnyvale, CA: Atari, Inc., 1983).
- ¹⁴ The Electronic Visualization Laboratory website, <https://www.ev1.uic.edu/info>, accessed, February 4, 2014.
- ¹⁵ Brown, Sheldon. “Introduction” in *Synthesis: Processing and Collaboration* (San Diego: The Gallery@Calit2: 2011), p. 5.
- ¹⁶ Private email discussing this essay prior to publication with Jamie Fenton, February 6, 2014.
- ¹⁷ Private email discussing this essay prior to publication with Jamie Fenton, February 7, 2014.
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- ²⁰ Chapman, Sara. “Guerrilla Television in the Digital Age,” *Journal of Film and Video* vol. 64, nos. 1-2, Spring/Summer 2012 p. 44.
- ²¹ Shamberg, Michael and Raindance Corporation. “Manual” in *Guerrilla Television* (New York: Holt, 1971) p. 8. The book is composed of two sections, “Meta-Manual” and “Manual,” each numbered separately.
- ²² Chapman, Sara. “Guerrilla Television in the Digital Age,” *Journal of Film and Video* vol. 64, nos. 1-2, Spring/Summer 2012 p. 46.
- ²³ MacDonald, Scott. *Art in Cinema: Documents Towards a History of the Film Society* (Philadelphia: Temple University Press, 2010).
- ²⁴ Antin, David. “Video: The Distinctive Features of the Medium,” in *Video Art: An Anthology*, eds. Ira Schneider and Beryl Korot (New York: Harcourt Brace Jovanovich: 1974).
- ²⁵ Moradi, Iman. *Glitch Aesthetics* (BA dissertation, School of Design Technology, Department of Architecture, The University of Huddersfield, January 27, 2004) pp. 28-33.
- ²⁶ Meagher, John R. *RCA Television Pict-O-Guide: An Aid to TV Troubleshooting, Volume 1* (Harrison, NJ: Radio Corporation of America, Tube Department, 1949) see pages 45, 49, 51, and 55 for examples of analog signal and technical glitches that reproduce visual phenomena resembling analog signal processing in early video art.