

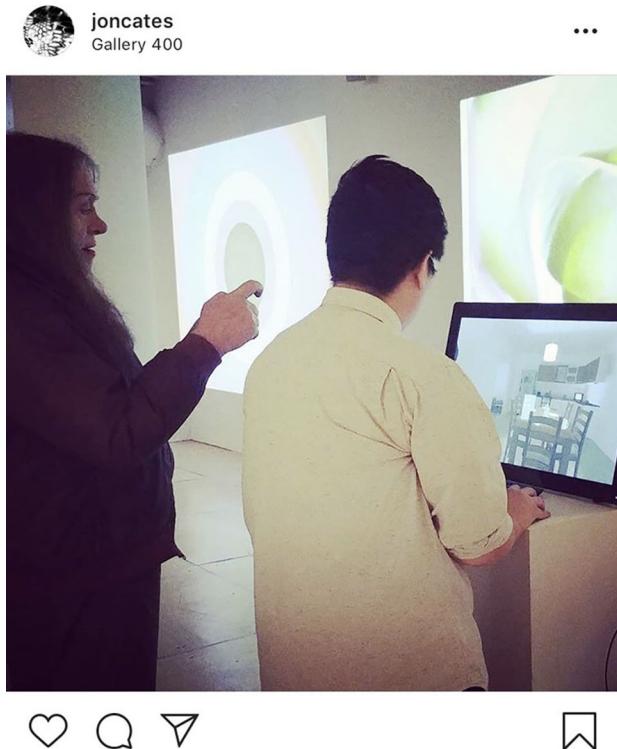
A Trans Historiography of Glitches and Errors

ABSTRACT In 1978, queer and transgender programmer Jamie Faye Fenton created the first piece of experimental video glitch art, *Digital TV Dinner*, using the Bally Astrocade, a home computer and game console of her own design that was, for six months, the cheapest home computer available. *Digital TV Dinner* stands as a record of computational failure: it was created by Fenton through a pointed misuse of the computer system that caused the screen to dissolve into waves of pixelated glitches. What might it mean to center the glitch as a historically trans mode of media production? And how might we write trans media history as a history of *unmediation*—that is, a history of undoing mediation? A history of things that cannot be documented, or that evade or dismantle mediation, in which the fullness of trans life and history exceeds the images presented in the screen itself? **KEYWORDS** Bally Astrocade, digital media, *Digital TV Dinner*, experimental video, glitch art, Jamie Faye Fenton, queer theory, software studies, transgender studies, videogame studies

Jamie Faye Fenton is tall, with long gray hair cut into blunt bangs. She wears blue jeans and a black leather jacket. We are here in 2018 at the art exhibition *Chicago New Media 1973–1992* at Gallery 400 in Chicago because on exhibit is an experimental glitch video titled *Digital TV Dinner* (1978, fig. 1). When I enter the exhibition’s gallery space, there is a video projection being played on the far wall, behind a set of arcade cabinets developed by Bally Midway, a Chicago video game and software company Fenton worked for in the 1970s. On the white wall in front of us, the projection cuts to a black screen with the words DIGITAL TV DINNER.¹

I stand alongside Fenton, watching the images she created with Raul Zaritzky (with sound by Dick Ainsworth) forty years ago using the Bally Astrocade, a video game and home computer system that debuted in 1977. The wall fills with a video projection of white and reddish-black squares, lines, and digital artifacts cascading down the full height of the room. The wall becomes the screen: the phrase “SELECT GAME” is garbled at the top of the wall, intersected by horizontal scan lines of white and reddish brown

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26 likes

joncates #Art #game's && #glitch's (#glitchArt)! #MediaArt
#Hystories && #remix's @gallery400 with @vgagallery

14 HOURS AGO

FIGURE 1. The author with Jamie Faye Fenton at Gallery 400, Chicago, 2018. Photo: Jon Cates.

(fig. 2). Repeating panels of artifacts line the wall from left to right, blocks of reddish black and dark blue assembling in patterns that look similar to the teeth on a comb, or the dots on the matrix of a punch card (fig. 3). There is a wipe downward that happens systematically throughout the video—a cascade, a waterfall—that clears the screen, filling it with reddish black only to fill it again with long lines and artifacts. The repeating patterns of blocks resemble the patterns in a QR code (fig. 4). Moment to moment the screen, the wall, is unmade. I watch the repetitions, the looping, the constant return to familiar arrays of artifacts and words like “PLAY” that are assembled and reassembled. The blocks of pixels undo themselves only to remake themselves again.

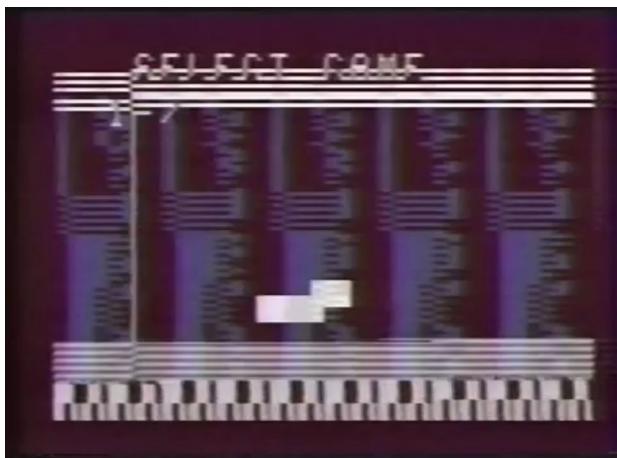


FIGURE 2. The phrase “SELECT GAME” is garbled at the top. Jamie Faye Fenton, Raul Zaritsky, and Dick Ainsworth, *Digital TV Dinner*, 1978.



FIGURE 3. Patterns reminiscent of the teeth on a comb, or the dots on the matrix of a punch card. Jamie Faye Fenton, Raul Zaritsky, and Dick Ainsworth, *Digital TV Dinner*, 1978.

Fenton is a queer and transgender computer and video game programmer, and the history of computational media production and glitch art is a transgender history. *Digital TV Dinner* is arguably the first piece of digital video glitch art ever created, and one of the first pieces of computer-generated video art that could be produced at home.² In 1977, Fenton managed the



FIGURE 4. Repeating patterns of blocks that resemble the patterns in a QR code. Jamie Faye Fenton, Raul Zaritsky, and Dick Ainsworth, *Digital TV Dinner*, 1978

production and design of the Bally Astrocade home computer and video game console, which was, for six months, the cheapest home computer on the market (fig. 5).³ Fenton designed the console's operating system and wrote the programming language it was built on, called Bally BASIC. She knew all of the possible outcomes for its hardware and software. She coded what the user could do with the Astrocade, and also what the user could *not* do: she programmed the error messages and error logs that would pop up on the screen when the computer could not compute something or carry forth a command.

And yet, in her work as a glitch artist, she was most interested in using the computer to produce imagery that was happenstance and beyond the binaries and boundaries of computational rule sets. These glitches were not produced through the purposeful writing of code, but instead provoked by the user pointedly *misusing* the computer system through applying a series of embodied acts to the hardware of the computer itself—slamming the device with a fist, ejecting a cartridge at the wrong moment. These actions, (mis)applied to the computer system, both produce the images and undo the system, unraveling the screen into a series of unexpected glitch images. These glitches dissolve the computer's interface into cascades of randomized visual artifacts that point toward computational failures that could not be anticipated or programmed, even by Fenton.

Digital TV Dinner stands as its own transgender, or trans, media historiography. It is a record of what-ifs, of outsides, of possibilities beyond the



FIGURE 5. The Bally Astrocade professional arcade and home computer, released in 1977. Photos: courtesy Evan Amos.

scope of what could be coded and anticipated. This glitch art piece is both a record of the failure of software and a record of trans history, labor, and embodiment, and what could *not* be captured by the computational system: Fenton's hands manipulating the console, repeatedly pressing eject on the Astrocade while it was processing to produce these small and beautiful

failures; the knowledge she had of the computer system as a closed loop; and her expressed wonderment in willing a computational system to produce something entirely unexpected, something beyond the closed circuits and rules and regulations of a software program.

Digital TV Dinner is a record of Fenton knowing a system so well, and so completely, that she could imagine how the system might be otherwise, and how it might be unmade. It is a record of the ephemeral, the unknown, what is unable to be captured, as much as it is a record of what happened. With many histories of computational media written as indexical series of facts, dates, archives, and records pointing toward the things that were ostensibly *there*, positioning Fenton and *Digital TV Dinner* as its own record of trans life, its own trans media historiography, imagines trans life as beyond the mediation of what is known, and what is capable of being held, by a computer system. It is a history that necessarily operates both within and outside of the boundaries of what can be stored, represented, and fully known. To position trans life at the heart of computational media history, and at the heart of the glitch, is to understand how trans media history is a history of undoing—how technological systems are done, and, most importantly, undone.

UNMEDIATING TRANS MEDIA HISTORY

What does it mean to write a trans historiography of glitches and errors? I write this history with the awareness of the embodied relationship between trans life and institutions, taking from trans studies the constant political awareness of the relationship between trans life and systems of governance enacted through nations, states, and institutions, which have become invisibly part of the binary rule sets enacted within computer systems.

Susan Stryker, Paisley Currah, and Lisa Jean Moore write: “Trans-’ . . . becomes the capillary space of connection and circulation between the macro- and micro-political registers through which the lives of bodies become enmeshed in the lives of nations, states, and capital-formations, while ‘-gender’ becomes one of several set of variable techniques or temporal practices (such as race or class) through which bodies are made to live.”⁴ The micro-political acts and practices of trans bodies are deeply affected by the macro-political regulation of gender and trans life. Trans is necessary to understanding this media history, and necessary to understanding Fenton and the glitch. Trans history is itself a history of mediation: it is tied directly to histories of trans people told through documentation, bureaucracy,

surveillance, archives, and other forms of mediating power of the state and nation. Stryker writes:

Previously, people who occupied transgender positions were compelled to be referents in the language games of other senders and addresses—they were the object of medical knowledge delivered to the asylum keeper, the subject of police reports presented to the judge; they were the dirty little outcasts of feminist and gay liberation discourses whose speakers clamored for the affects of the liberal state. The psychotherapist whispered of them into the surgeon’s ear, while the lawyer nodded in approval. Only rarely did we speak to others on our own behalf.⁵

Trans history is a history that has been told through others, through documents, through institutions, through mediation. To write a trans media history is to be aware of what it means for trans lives to be taken, represented, and told to others, and the history of these practices. A trans media historiography must reconsider what mediation is, and what mediation does, and ask: How can one write a trans media history when mediation itself has such a violent history in relationship to trans people and the histories we are told through?

What does it mean to write trans media history as a history of *unmediation*—that is, a history of *undoing* mediation? A history of things that *cannot be documented or mediated*, or things that *evade or dismantle mediation* in relationship to trans life? Unmediation can take several forms. The first is considering trans media history as one that evades knowability, with trans life as “missing” from representation, archives, and recording within histories of media (and particularly computational media). When writing trans media history, we must always be aware of that which *cannot be saved, that which will always evade documentation and mediation*, and things that *have not been recorded or cannot be recorded* in relationship to media.⁶ Secondly, unmediation brings to the foreground the construction and interruption of mediation itself as an active and often linear process, a movement of a signal from sign to signified, input to output. Here, unmediation is the awareness of how power circulates within and around media technologies, and the undoing of these systems. With regard to Fenton, unmediation takes the form of the breakdown of the screen through the glitch, which makes the user aware of the construction of the computer system, and the user’s own interpellation (or lack of interpellation) within these systems.

Interpellation is a word that can be used to describe the way users and citizens are addressed and the way users and citizens identify themselves

within systems of governance. Wendy Hui Kyong Chun discusses this in relationship to software, writing that “importantly, the ‘choices’ operating systems offer limit the visible and the invisible, the imaginable and the unimaginable. . . . You are not, however, aware of software’s constant constriction and interpellation (also known as user-friendliness) unless you find yourself frustrated with its defaults.”⁷ Chun draws parallels between software and citizenship and the ways in which institutional systems of governance and computer systems both interpellate or expect and anticipate the actions and presences of certain users, certain citizens.

The glitch itself poses a momentary experience of undoing, unmending; the artifacts that appear on-screen show us the breakdown of these systems and a fleeting awareness of the way we are imbricated, or unable to be imbricated, within its systems and structures. The glitch might appear as blocky artifacts that take the shape of ghostly faces when streaming a low-latency video online; the crashing of Microsoft Word or Photoshop when it is unable to complete a task; or a moment in a video game when an avatar’s body sinks through the ground, clipping through the boundaries of the world itself. These everyday glitches—happenstance, unintended, random—call attention to the fact that these software systems are designed to be *immediate* but in reality are *mediating*, serving as an intermediary. To unmediate is to call attention to this continuous mediation, to the continuous interpellation we experience through media, to the fact that systems of governance function similarly—that some people are interpellated fully into systems of power, while others are not.

For many trans people, and especially Black and Indigenous trans people and trans people of color, this experience of interpellation is broken constantly, revealing the ways in which government systems do not anticipate our presences. We become aware that there are many mediating steps that comprise seemingly fluid, everyday actions like moving through workplaces, homes, and public spaces, or getting access to passports, visas, and medical care. To unmediate is to see the constant systems of rules, the violence of representation and documentation, and the ways in which mediation does not work in expected ways, too, for trans people, or for trans history.⁸

The glitch itself is revelatory in relationship to power structures. While some might experience glitches as accidental moments in their everyday use of technology, such moments are still moments of undoing. In the case of Fenton, it is the pointed and continuous undoing within *Digital TV Dinner* that allows for a startling suspension of this glitch moment into moments, and these moments into minutes. This suspension of the glitch undoes the

computer, the game console, and the screen almost to the point of complete illegibility. As we watch *Digital TV Dinner*, we are resting in a moment, expanded, in which we are no longer interpellated, in which the screen itself is no longer functioning as a representational intermediary, in which we watch computational interfaces dissolve from symbols to signals that blink, irregularly, struggling to signify.

In positioning the glitch within this trans historiography of glitches and errors, we must consider the tactic of suspension. While the glitch itself is an everyday, and oftentimes accidental, moment in relationship to media technologies experienced by many, Fenton's experimentation with duration, length, and suspension play a part here in positioning the glitch as a trans mode of production. The glitch, as mobilized by Fenton, is not a fleeting moment of failure, but two minutes and forty-one seconds of undoing. It is a collection of the effects of the repeated bodily acts that Fenton imposes upon the machine. It is a constellation of moments, dotted through time, spliced and edited together in the glitch video we know as *Digital TV Dinner*. The video itself is a sustained and lingering deconstruction of the sovereignty of the computer system. It highlights the ways in which we might imagine alternative possibilities, and alternative futures, for the computational rule sets we have internalized so greatly that they have become invisible.

HISTORY AS MEDIATION

I write a trans historiography of glitches and errors with the awareness that history itself is a form of mediation: an assemblage of information that takes the shape of a person or objects that are deemed meaningful or important. Fenton was the “first” in several domains of history, but it is not enough to position transgender life in histories of digital media as a series of elided “firsts.” To write a trans media history, we must also consider unmediation: the undoing of the way history mediates, with an awareness of historiography itself as a set of practices that hierarchize certain modes of knowing, of being, over others.

A “traditional” history of Fenton and her place in computing history might be positioned with regard to industrial histories of games and computation, focused on dates, objects, and firsts: The fact that Fenton was one of the founders of MacroMind, a software company that operated in Chicago in the 1980s, which later became Macromedia and was then acquired by Adobe Inc., which produces software like Adobe Photoshop and Illustrator. The fact that Macromedia Director, a program Fenton created, became

Adobe Director, which was the precursor for what we know as Flash, a platform used in most major web browsers to run games and interactive and visual media.⁹ The fact that she led the team that designed and implemented the Bally Astrocade home computer and video game console, which at \$300 was the first and cheapest of its kind for six months.¹⁰ The fact that the Astrocade utilized the Zilog Z80 microprocessor and therefore situates trans life, labor, and history within the movement of computers and microprocessors from institutions to home spaces.¹¹ We might also consider the history of *Digital TV Dinner*'s debut at the University of Illinois at Chicago's *Electronic Visualization Event 3* in 1978 and its later broadcast on WTTW's *Image Union* public television program in 1979.¹² Or that the Bally BASIC programming language she adapted for the Bally Astrocade home computer and game console was designed to be sold to households with coding literacy in mind. And lastly, the economic and capitalistic failure of the Astrocade in the wake of the Video Game Crash of 1983 and how this movement toward "accessible" home computing in terms of both the cost of the computer, and the use of the computer as a learning tool for programming, might be viewed as one possible trajectory of many for the home computer that was later outmoded and overcome by companies like IBM, Microsoft, and Apple.

To write a trans historiography of glitches and errors is to unmediate an entire mode we use to write and tell media histories. Noting the "firsts" or "onlys" of something, especially with regard to queer and trans histories of digital media, is itself an eliding process, which reinforces the idea that existing histories of technology are already complete timelines with momentary lapses in acknowledging the contributions of marginalized people.¹³ Many existing histories of technology are centered on computational objects and their preservation, which is predicated on the institutional form of the archive itself and its systems of funding, ownership, physical space limitations, and relationship to institutional modes of deeming who matters, what matters, and what is saved.

The "addendum" and "revision" are regulatory and necropolitical acts that have been enacted in a number of historical and institutional circumstances with regard to queer and trans life, and especially Black and Indigenous queer and trans lives and queer and trans lives of color. To write history is to produce an assemblage of facts and information, and this history is highly mediated, historically situated, and revisionist, not unlike the *Diagnostic and Statistical Manual of Mental Disorders* itself as a clinical archive that documents the changing orientation of the American Psychiatric Association, and the US medical-industrial complex at large, toward the regulation of gender

and sexuality.¹⁴ The revision and the addendum are institutional acts of knowledge curation that reinforce historical systems of governance with regard to who may revise these histories, why, when, and for what reason. Achille Mbembe writes in “The Power of the Archive and Its Limits” (2002):

The archive is primarily the product of a judgement, the result of the exercise of a specific power and authority, which involves placing certain documents in an archive at the same time as others are discarded. The archive, therefore, is fundamentally a matter of discrimination and of selection, which, in the end, results in the granting of a privileged status to certain written documents, and the refusal of that same status to others, thereby judged “unarchivable.” The archive is, therefore, not a piece of data, but a status.¹⁵

We must consider the way that histories of technology have been written as careful collections of documents and facts narrativized into movements toward technological “progress,” which is itself a racist and colonialist ideology. We must also call attention to the methodology of “adding back” elided marginalized people to histories of games and technology as, in and of itself, a historiographic process that has the potential to reinforce the same systems of power that elided us to begin with. The “adding on” of marginalized people, especially queer and trans people and people of color, to these supposedly linear histories (which are overwhelmingly focused on dates, objects, firsts, financial successes, and market saturation) reinforces existing modes of historiography: who we deem important, why something is important, what people thought was worth being saved, and what space they had available to save it. Laine Nooney criticizes the addendum as a historiographic method in relationship to women in video game history in “A Pedestal, A Table, A Love Letter: Archaeologies of Gender in Videogame History” (2013):

I am occupied with the historical mechanisms through which gendered bodies become legible to videogame history. . . . For, what does it mean to “make [this history] wider”? If “making wider” is simply an act of adding to a body of already visible thought in order to locate the “roots of electronic gaming” . . . then videogame history does this quite frequently in relation to histories of women. If all we try to do is “widen” the scope of analysis, questions about the relevance of marginalized identities and historically specific subject positions can only be dealt with through an “additive” mode as in: “Oh, let’s add women on. Let’s put them back in.” . . . The historical analysis “widens” to see them, yet cannot account for their historical marginality.¹⁶

To write a trans media history, we must also be aware of the mediation of history itself, and call attention to the modes with which facts, dates, archives, and data have stood in, mediated, and become representations of trans life and trans history. We must be aware of media, and the act of mediation itself, as always necessarily materially and historically specific, imbued with their own practices and politics. I write this trans historiography of glitches and errors with the awareness of what has not been saved. Re-centering the ephemeral, and the acts, erasure, and embodiment within computer and video game history, allows us to argue that what has been lost—the objects missing from archives, the trans histories that are left out of historical narratives, all things that have not been recorded—have a life and a history that we can still trace, and which is still meaningful, that still anchors us as trans people to our pasts, presents, and futures.

INSIDE/OUTSIDE, ERROR/GLITCH

The history of computational media is a history of enumeration—of “computing,” the word taken at its most basic value—and the use of computers to hold information meant to stand in for lives, time, and locations, rendering them as data. Populations are accounted for through the mapping and accounting of bodies to smaller and smaller units that could fit into smaller and smaller spaces: the punch card, the transistor, the microchip. We might read the history of computing as a history of density, a history of compression, a history of space, motion, of inside and outside.¹⁷ In situating the body as documented *inside* of these systems, I also ask, is there an *outside* to this system? And what might a trans history of glitch tell us about imagining the possibility of an *outside* to these technologies of sovereignty?

Nael Bhanji writes about border crossing, motion, and movement, noting that narratives of linear progression that establish *before* and *after* and *inside* and *outside* as fixed objects, tied to place, are colonialist frameworks for orienting narratives of trans embodiment and history:

Contemporary transsexual narratives are often accounts of linear progression: the journey from one location to another—“from fragmentation to integration, from alienation to reconciliation, from loss to restoration”—where one is meant to leave the transgressive space and transition *towards* one’s fully embodied identity. The transitional journey itself is merely a link between locations—a sort of gendered non-zone between origin and destination—and not a place to call home.¹⁸

I return here to the idea of an outside and an inside to computer systems, their coded enforcement of rule sets and systems thinking, and how we might imagine the momentary glitch itself as this “non-zone”: a place of movement, fluctuation, and in-between-ness that calls attention to the fact that the glitch is a motion, a movement, a flux rather than a resting place, a point A or a point B. The glitch presents us with moments of fleeting possibility and promise—imagery that signals to us that there is something beyond the coded boundaries of rule sets within software systems, that there might be the possibility for something unintended, something unstable, something unimaginable whose status is never quite fixed, never quite bounded.

The processes that computer systems are purposefully coded to perform might be viewed as an *inside* to the system, with a purposefully programmed and known set of outcomes. For instance, if a user types a command, the computer is programmed to either accept the command or reject it due to not being able to process it, and the system will reveal this error to the user with an error message, or the simple inability to carry forth with a task. This way of conceptualizing software error does not break the computer. Instead the computer is able to enforce its limitations and regulations on the user—“No, I can’t compute this information, it’s not numerically possible,” the computer might think, and the computer might respond to the command to divide two by zero with an error message in the visual interface. The software error internal to the computer system is designed to communicate to the user the boundaries of what the computer can do, effectively enforcing a limitation on the user’s ability to manipulate the system before the user can exceed these boundaries and break them.

If we conceptualize the error as *inside*, we might be able to position the glitch, a kind of software failure, as operating *outside*—a breaking and overcoming of the computer system and its coded boundaries, a melding and dismantling of these rule sets as sovereign. In the glitch, failure is positioned not as a *state* but an *act* that dissolves these boundaries, breaks these limitations, and in turn produces completely uncoded, unseen, and unanticipated visualizations within the computer’s interface.

SORRY: THE SOFTWARE ERROR

The Bally Astrocade relies on a programming language that Fenton wrote called Bally BASIC, or Beginners’ All-Purpose Symbolic Instruction Code, which was based on Li-Chen Wang’s programming language Palo Alto Tiny

BASIC. The 1981 version of the instruction manual for Bally BASIC begins with the following:

Welcome to the world of computers.¹⁹ There are many versions of BASIC as well as several other computer languages. The term, BASIC, is an acronym for: Beginners' All-purpose Symbolic Instruction Code. Bally BASIC is a language designed to make computers and programming easier to understand. It is an expanded version of Li-Chen Wang's Palo Alto Tiny BASIC. Written by Ja[mie] Fenton, Bally BASIC allows you to program or create pictures and sounds accompanied by a full range of 256 color choices. Bally BASIC expands your computer by letting you program your own computer games, electronic music and video art.²⁰

Marketing flyers from 1979 called the console the Bally Computer System and noted that it contained an “exclusive, built-in Bally Brain,TM a powerful microprocessor, [that] creates a ‘memory bank’ of more than 12,000 instructions” (fig. 6).²¹ The cassettes (also called cartridges) sold for the Astrocade were unique in that they also contained their own chips for memory storage, where users could “add up to 8,000 more bytes with each VideocadeTM Cassette.”²² Much of the language in these marketing materials positioned the Astrocade as a computer that would allow users to become familiar with coding and creating visual media, including games, digital art, and computer-generated audio, programmed using Bally BASIC, which came packaged with the Astrocade as a separate Videocade cassette. “It’s instant creativity with Bally BASIC,” a second advertising flyer reads. “This programming cassette is an easy-to-understand version of the BASIC computer language [used] to help users create their own games, art, and electronic music. With these important exclusives: A self-teaching course that lets users create programs in minutes, an easy to use programming keypad.”²³

A 1981 marketing flyer highlights the bundling of the Bally BASIC cartridge with each console as one of the console’s main selling points: “The most fun game of all is learning to create your own computer programs. Now there’s no easier way to learn about computers than with the new Bally BASIC system. This plug-in cartridge with built-in audio tape interface converts the ARCADE into a personal computer you can program yourself” (fig. 7).²⁴ Fenton and the Astrocade’s creators imagined the home video game console as a full-fledged computer that could code and produce its own software. The manual for the Bally BASIC, which she wrote with Dick Ainsworth, George Moses, and Brett Bilbrey, includes lessons on “Printing,



FIGURE 6. Advertising flyer for the Bally Computer System, 1979. Image: courtesy BallyAlley.com.

Counting, and Loops,” “Subroutines,” and “Arrays.” After these primers, the manual then moves on to lessons about writing code to produce computer-generated media with sections titled “Video Art,” “Electronic Music,” “Graphics,” and “Computer Games” (fig. 8).

In a 1978 paper given by Fenton, Thomas A. DeFanti, and Nola Donato titled “BASIC Zgrass: A Sophisticated Graphics Language for the Bally Home



FIGURE 7. Advertising flyer for the Bally Computer System, 1981. Image: courtesy BallyAlley.com.

Library Computer," they outline their vision for making the programming of computer graphics and computer-generated art accessible to home computer users. They situate the video game console and computer hybrid within a particular historical moment for home technology users and hobbyists, describing the movement of computers to home spaces within the context of amateur (or ham) radio and the computer literacies required to teach users to code:

CONTENTS

Operating Instructions

Programming Course

Lesson 1	Printing, Counting and Loops	17
Lesson 2	Random Numbers, Inputs and What If?	24
Lesson 3	Subroutines	30
Lesson 4	Arrays	35
Lesson 5	Electronic Music	40
Lesson 6	Graphics	46
Lesson 7	Computer Games	54
Lesson 8	Video Art	61
Lesson 9	Three Voice Music	66
		71

Programs

Computer Games
Electronic Music
Graphs and Charts
Video Art
Learning Skills

Appendix

A	Character Code Table	98
B	Bus and Connector Structures	99
C	Memory Map	101
D	Input and Output Ports	102
E	Bally Basic Data Base Locations	103
F	Bally 300 Baud to 2000 Baud Tape Converter	104
G	System Block Diagram	107
H	Bally Commands and Functions Summary	108
I	General Specifications	115

FIGURE 8. Contents page of the Bally BASIC manual (Columbus, OH: Astrovision, Inc, 1981).

Home systems are not trying very hard to be cheap minicomputers for expert users. These users when at home can be likened to the ham radio operators of the nineteen fifties, able to change diodes, violently shake intermittent boards and, in general, understand the innards. These persons can also get gratification from fighting with manuals and the trials of the latest software release, just as we professionals do for a living. Zgrass, however is designed for the two-hour-a-week user. This type of person is guaranteed to continually forget the syntax and semantics of whatever software exists. Zgrass is designed (certainly at the cost of computer time and memory use) so the user does not have to rely on a manual to decipher everything.²⁵

Fenton, DeFanti, and Donato position the Bally Astrocade as *counter to* the computer hobbyist movement, writing that ham radio was saturated with home users who were experts, well-versed in the technologies they were using from home.²⁶ They write that minicomputers, which were very recently

becoming household items, were similarly objects of technical proficiency, rendered inaccessible not so much due to cost, but due to lack of access to household programming literacy.

The error message is positioned within this paper as part and parcel of computer literacy and as a disciplinary method to structure and regulate user interaction. The manual for Bally BASIC discusses how errors are communicated to the user, with advice like, “If you make a mistake in punctuation (as in leaving out a comma), the computer cannot run your instruction. If this happens the computer will print the instruction on the screen with a question mark in the position of your error, to show you where your mistake is.”²⁷ In the same conference paper, Fenton, DeFanti and Donato propose the programmed software error as a kind of pedagogical tool that would allow coding and programming to become easier for novice programmers:

The essence of the teaching problem stems from the fact that novices have tremendous problems with meaningless (to them) error messages. You really have to know nearly everything about a system before you can start knowing why what you have typed does not work. This is absolutely not an overstatement of the problem. . . . Commands are gentle to users. If not enough arguments are supplied, if an incorrect argument is given or the argument is non-existent, a special error fixup routine is entered. This routine prints out the command in error, points at the argument in error and says, for example, “No! this command wants a variable name here.”²⁸

The Bally BASIC programming language is built around simplifying the signaling of error on the behalf of the computer to the user. The error is a system that has always been in place—the computer signaling in various capacities that the user’s input is illegible, incomputable, unrecognizable, unactionable. That the user’s capacity for acting within the system is not possible.

In early 2020, before the shutdowns due to COVID-19, I made several research trips to the Phil Morton Memorial Research Archive, housed in the School of the Art Institute of Chicago. The collection was curated by Professor Jon Cates, and I visited under the supervision of educator and glitch artist James Connolly. The archive itself is a room filled wall-to-wall with old magnetic tapes in a variety of formats, from Sony U-matic to VHS. Over the



FIGURE 9. Tapes the author digitized at the Phil Morton Memorial Research Archive at the School of the Art Institute of Chicago, 2020.

course of several weeks, I digitized a small group of U-matic tapes that, I had been told, had never been viewed or dubbed before. Among the videos I digitized was a series of KC-60 U-matic cassettes with the titles “B-BASIC WITH DAN” scrawled on them in block letters and numbered from one to three (fig. 9). The tapes begin with a video capture of a television screen hooked up to the Bally Astrocade. The voice of Dan Sandin, a computer graphics artist and creator of the Sandin Image Processor (an analog synthesizer that was used to augment video art in real time) narrates the code he enters and executes on the screen.²⁹ Throughout these three tapes, Sandin gives a live demonstration of how to program sounds and images with the Bally Astrocade home computer.

Sandin’s first demonstration on the first tape is a lesson on the error messages that have been programmed into Bally BASIC programming language. Sandin begins, “Let’s start with the error messages. . . . There are three error messages. . . . Now, a normal large computing system normally has several hundred different error messages. This one, which is a very minimal system, has three.”³⁰ The three error messages, as Sandin demonstrates, are programmed to be presented by the computer to the user when the computer does not understand the user’s input: WHAT?, HOW?, and SORRY. These error messages are earnestly colloquial, each signaling a different type of lack of comprehension on behalf of the computer and the limitations of the user.

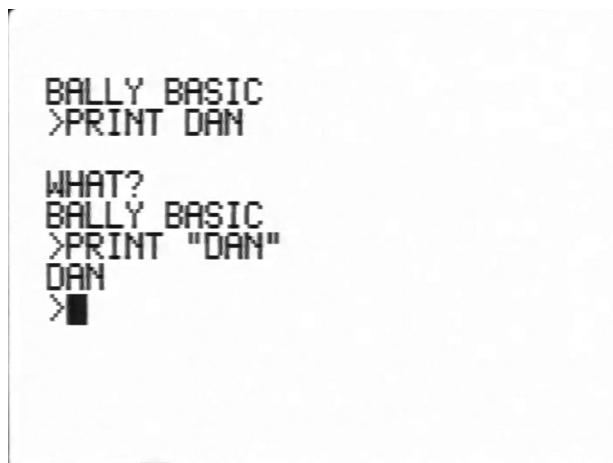


FIGURE 10. WHAT? Screenshot from *BALLY BASIC W/DAN #1* (Dan Sandin), undated.

In the video, Sandin goes through the process of manufacturing circumstances in which these three error message would appear on-screen.

WHAT? appears when the computer cannot recognize a statement. The example he gives is a statement with incorrect syntax—he types >PRINT DAN, which the computer cannot take in as a list of commands, asking WHAT? Sandin then corrects the statement to >PRINT “DAN”, with quotation marks, which allows the computer to execute the statement and print the word “DAN” on the screen (fig. 10).

HOW? appears when the computer understands the syntax of the statement but can’t execute the statement. In this case, Sandin asks the computer to divide ten by zero. He types >PRINT $10 \div 0$, and the computer responds with HOW? He then corrects the query to >PRINT $10 \div 1$, and the answer is printed: 10 (fig. 11).

SORRY appears when the computer does not have the hardware capability, specifically memory in this case, to execute a process or command. The example Sandin gives is >PRINT @ (1000) , to which the computer responds with SORRY (fig. 12). Sandin explains: “What happened here was that it tried to find the value stored in an array number 1000. It’s in a sense a number one bigger than I’ve got . . . available memory for, and the ‘sorry’ command is an error message that says ‘Sorry, I’m all filled up, you have to delete something.’”³¹

```
>PRINT A
>PRINT "A"
A
>PRINT 10÷0
HOW?
BALLY BASIC
>PRINT 10÷1
10
>■
```

FIGURE 11. HOW? Screenshot from *BALLY BASIC W/DAN #1* (Dan Sandin), undated.

```
>PRINT @10
WHAT?
BALLY BASIC
>PRINT @(10)
0
>PRINT @(1000)
SORRY
BALLY BASIC
>■
```

FIGURE 12. SORRY Screenshot from *BALLY BASIC W/DAN #1* (Dan Sandin), undated.

There is a cybernetic loop that the user is encouraged to perform with the computer through these error messages—a constant, preprogrammed stream of feedback between user and machine where the user interacts with the computer in ways the computer anticipates (typing out commands using the Bally Astrocade’s keypad), and the computer announces to the user the possibilities of what is programmable, and what is error, through its user

interface. The visual interface here functions disciplinarily: it encourages the user to continue interaction with the computer within the terms that the computer communicates to the user. In Bally BASIC, the error message is designed to be corrective: it signals to the user what is possible and impossible for the user to do, and the user learns from this what actions are possible and encouraged and which are not, enforcing a feedback loop governed by the software system that dictates the behavior of the user.

The error, manifested in the screen, is a signal. These signals manifest in the Bally Astrocade as blank, uniformly colored backgrounds with black text. They manifest as letters that form legible words and syntax, communicating to the user the limits of what is possible and able to be executed. Fenton's coding of the hardware limitations of the computer through the error message apologetically, and colloquially, reinforces a coded boundary that has been positioned to prevent the user from going any further, from affecting anything more, that signals the end of motion or possibility. SORRY, the program says. SORRY.

PLAY A GA7: THE GLITCH

In 2018, Fenton created a video titled *Primordial Glitch Art*. In it, she sits in what looks like her home office. Behind her on the desk is a trapezoidal box with a wood-grain pattern adorning its front lip and sides: the Bally Astrocade. This Astrocade is missing the smoky plastic lid that normally sits on top of the console, revealing a recess filled with an array of cartridges. From my own experience encountering the console at the Phil Morton Memorial Research Archive at SAIC and the Strong National Museum of Play in Rochester, New York, I know a few additional things, too: That the console is largely covered in dark brown lightly pebbled plastic, with wood veneer covering its sides, and yet it still has a heft and weight to it. That the gold trim lining the edges of the console is gold paint on plastic that flakes off over time, but the golden number pad has a thin aluminum-like covering that is cold to the touch. That the console very easily accumulates dust in its crevices and corners. That the Astrocade is very prone to glitches: when I first turned on the console and inserted a cartridge at the Strong, I was met immediately with a screen filled with bright repetitions of pink and white horizontal lines that appeared to break and rejoin in jagged steps from the upper left to the lower left of the screen (fig. 13), an image that persisted until I turned the console off.



FIGURE 13. Glitches that appeared on-screen after the author turned on the Bally Astrocade at the Strong National Museum of Play, Rochester, New York, 2019.

In the video, Fenton faces the camera, with long salt-and-pepper hair tucked into the neck of her gray T-shirt. “What I’m using here is a Bally Astrocade computer hooked up to a TV to channel 3,” she says. “What I do is I take one of these cartridges, I insert it into a slot here.” She holds a copy of a cartridge titled *Blackjack* (1978) and presses it into the console. “I press reset. Then I usually enter into the cartridge’s thing, and I spit the cartridge out.” She starts up *Blackjack* and arrives at its bright green opening menu, which reads “Player 1 Place Bet.” Once the cartridge is spit out, this menu flashes into a series of black vertical lines of different widths over a white background. This screen flashes to this pattern for half a second before the console resumes normal function and returns to the Bally’s “SELECT GAME” menu. “And you see, you get a glitch,” Fenton says. “Let’s do a few more of these. Depending on how lucky you are, you get different types of glitches.”

Fenton describes out loud what she is doing with her body, and how the console is responding to her. Because the generation of these glitches is so repetitive, she describes the same procedure several times as she executes the same actions over and over throughout the one-minute, forty-three-second video. “I work the user interface here, make some selection, and at some point



FIGURE 14. Green screen with blocky pixels at the bottom in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

while the code is actually executing the game, I spit the cartridge out and press the eject button,” she says while producing another glitch. This time the screen flashes briefly between a green screen with blocky pixels at the bottom (fig. 14) to another frame filled with vertical lines of varying widths (fig. 15). Each frame lasts barely a second, maybe even a fraction of a second.

The act of pressing the eject button is something she performs using both hands, with one hand operating the Astrocade’s keypad and the other pressing the eject button under the cartridge slot, with one act happening quickly after another. The screen abruptly flashes to a barely half-second-long frame of a garbled image before quickly shifting back to the console menu screen. “And see, different types of glitches, different circumstances,” she says, as she produces another half-second error. She leans her body in toward the console. “Sometimes it resets just like that, other times . . . [something] more interesting.”

Fenton ejects *Blackjack* and inserts a *Star Battle* (1978) cartridge. Immediately the small TV screen fills with tumbling, serrated lines of pixels that cascade in intervals down the screen, like a Slinky falling down the stairs (fig. 16). The screen then washes from top to bottom in waves, producing long vertical stripes that look like a smearing bar code, a waterfall (fig. 17). The screen moves back and forth between these two types of glitches—the waterfall and the cascade—for twenty seconds. It is an impossibly long time considering the length of the previous glitches, which flitted in and out of existence. Here, the glitch lingers. We cannot miss it, we cannot mistake it for



FIGURE 15. Frame filled with vertical lines of varying widths in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.



FIGURE 16. Cascade in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

anything other than what it is. I watch the back of Fenton’s head as she gazes at the screen, watching the pixels move. She’s silent for a few moments. “Not sure what we did to deserve that one,” she suddenly says, glancing at the camera, smiling, then turns quickly back to the screen to watch. “That one just goes on and on and on,” she laughs.



FIGURE 17. Waterfall in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

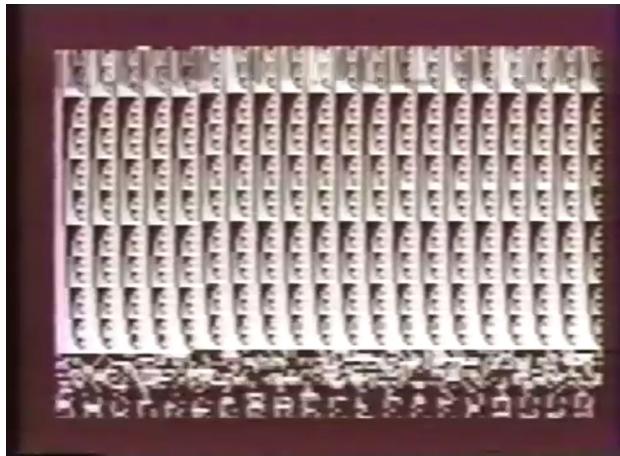


FIGURE 18. Algorithmic curling of a sea wave or the curve of an Ionian column in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

When I watch *Digital TV Dinner*, all I can think about are the things that are not there, that are not represented, and the things that the video is not a record of: The labor of Fenton's hands repeatedly jostling the hardware console, ejecting the cartridges, over and over, if only for a momentary, half-second cascade of pixels and blocks to appear on-screen. The time it took to

generate enough half-second to ten-second glitches to fill a two-minute, forty-one-second video. The fact that *Digital TV Dinner* has been edited to isolate the glitches on the screen, and how these cuts remove the full duration of time it took to generate these images. I think of the home spaces in which this computer and video game console existed, and the spaces in which this piece of glitch art was created, and the bodies that necessarily must have moved, must have circulated around it, to produce these glitched signals. All of these things are not represented in the glitches on the screen, but these things must have happened, must have been there, for this video to exist.

The glitches in this video call attention to everything unseen, unsaved, and the undoing of the programmatic, the symbolic: the movement of sign → signified. The pixels in *Digital TV Dinner* assemble themselves in shapes of varying sizes and repeat in varying intervals, with configurations shifting from moment to moment. Some moments the interface dissolves into what appears to be a randomized assortment of small squares, dancing and moving across the screen like static or noise on a television set. Other times these blocks appear in larger sizes, with more obvious assemblages of repetitions and randomizations. In one moment, the patterns repeat in horizontal layers, pixels forming what looks like the mathematical curling of a sea wave or the curve of an Ionic column (fig. 18). In the next, the screen fills with vertical repetitions that take the shape of what looks like a series of spectrograms, or sound waves, turned on their side, reminiscent of the ridges and repetitions of a tapestry (fig. 19).

In all of this, there is constant motion: The prickling of static dancing across the bottom of the screen. The screen wipes that move downward and upward that clear the pixels from the screen in waves, or introduce new patterns of pixels. The constant and irregular leaps between one panel of pixelated patterns and another, with one image jumping from what looks like the ridges of a bar code (fig. 20) to patterns that repeat diagonally, like the topstitching on a quilt (fig. 21). There is a constant undoing and remixing of familiar assemblages: the top of the screen, reserved for titles and contextual menu information in the Bally Astrocade's interface, is rendered into pixelated blocks or glitch-ridden text that scrambles, undoing itself. It begins with "PLAY A GAME" (fig. 22), later flashing to "PLAY A GA7" (fig. 23), and even later, flashing into blocks of scrambled pixels that take the shape and form of letters, words, and language, without connection to a signifier (fig. 24).

I see, in these moments, a computational system that cannot fulfill the functions it was designed for. Instead of the seamless procession of

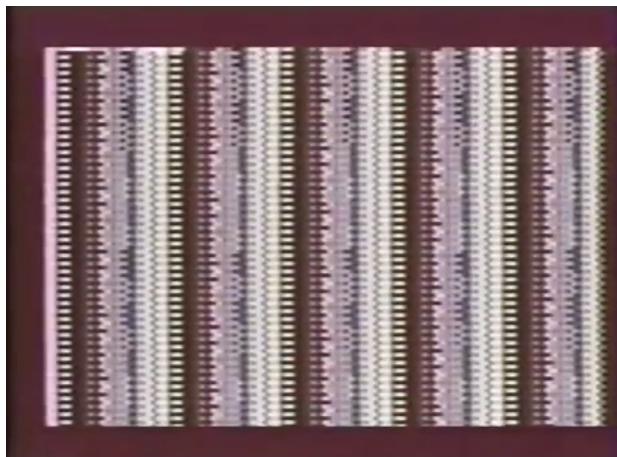


FIGURE 19. Spectrograms, or sound waves, turned on their side, reminiscent of the ridges and repetitions of a tapestry in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

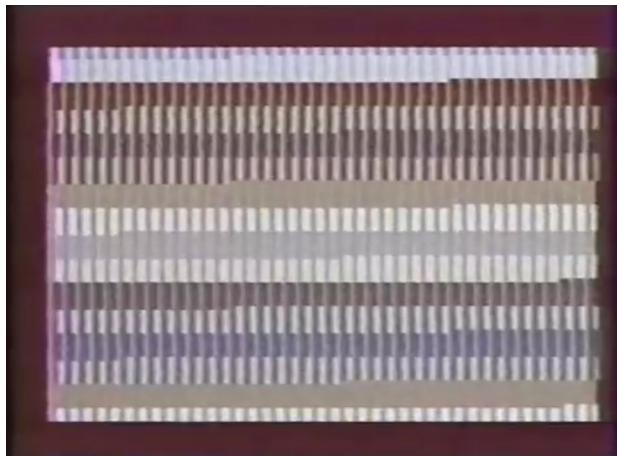


FIGURE 20. Ridges like a bar code in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

input → output, there is a breaking of this programmatic linearity, with the assumption that the screen fulfills a function, conveys a message, to the user. Instead with the glitch, the → of this equation stands on its own: a record of movement, of motion, of processing, of failure as a verb rather than a state. And here, in *Digital TV Dinner*, we linger in this moment, expanded into



FIGURE 21. Like topstitching on a quilt in Jamie Faye Fenton, *Primordial Glitch Art*, 2018.



FIGURE 22. PLAY A GAME. Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

minutes, experiencing waves of this →, this motion, instead of lingering at the moment when the glitch began, and wondering when the glitch will end. We are affected by cascades of these glitches that seem to go on endlessly. In *Digital TV Dinner* the glitch becomes a wading pool, a “place to call home,” as Bhanji writes. We linger here, we are suspended here, in these moments, stitched together, losing track of where and when something begins, and

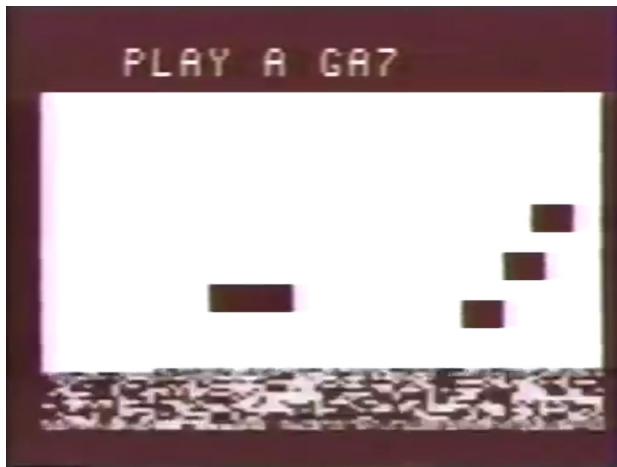


FIGURE 23. PLAY A GA7. Jamie Faye Fenton, *Primordial Glitch Art*, 2018.



FIGURE 24. Jamie Faye Fenton, *Primordial Glitch Art*, 2018.

where and when something ends. We sit here, in this moment of undoing, watching the structures and systems we know become continuously undone, looping, repeating, watching as shadows of the familiar interface are broken into components, into pixels that shudder on and off in patterns and arrays.

This is unmediation: undoing as a verb, a process. It is the lingering on the movement of a signal as it is translated from one state to another:

sign → signified, input → output, with the → itself as an unquestioned and invisible intermediary, a type of mediation that moves a signal between positions. Unmediation is the questioning of the linearity of these processes and movements. Unmediation is a signal that is jammed, reversed, or broken, or called attention to and extended as it moves between states.

LUCKY, DESERVING

This, too, is trans methodology. Fenton's patient dismantling. Her solidity, returning time and time again to the same seemingly unyielding systems. Her certainty that embodying the same actions, enacting the same movements, will produce the flickering possibility of different outcomes, unanticipated futures. Her knowledge of a system that is so complete that she knew there were more possibilities beyond the SORRYs, the WHATs, the HOWs. Her desire to linger in disparate moments of disruption, stitched together as evidence of the trans life that must have breathed, moved, labored, for something like this to exist.³² She shows us that the coherence, monotony, and sovereignty of the computer system does not and cannot dictate all that is possible, all that is available to us.

Two words in particular that Fenton uses to describe the process of producing glitches and glitch art strike me: *lucky*, and *deserving*. "Not sure what we did to deserve that one," she says, as if the glitches are a gift we have been given, each time she restarts the console. *Digital TV Dinner* can only exist because of her patiently repeating the same steps over and over. As the programmer of the Bally Astrocade, she coded all of the software's rulesets and boundaries. She knew what could be done with the console, and in silhouette, what could not be done. And yet there is a joy she takes in repeatedly running up to the same threshold and knocking at the same door, each time with both the hope and certainty of the computer producing something even she could have never intended or imagined. Her wonderment is startling: each time a glitch appears, she remarks that we might not be deserving of these moments of breakage, these instants of something *else*, something *other* that gives us a brief and wonderful glimpse beyond the possibilities tightly held and predetermined by a binary computer system. ■

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software and hardware development, looking at the intersection of queer and trans medical history, surveillance, and policy with computer and video game history.

NOTES

This research would not have been possible without the support of many. I would like to thank Jon Cates for his incredible support of my work as well as for founding the Phil Morton Memorial Research Archive at the School of the Art Institute of Chicago, which has been such a treasure to look through. My heartfelt thanks go to Chaz Evans, Jonathan Kinkley, and VGA Gallery, whose support of my research and design work has meant so much to me over the years, and I would like to thank Jon, Chaz, and Jonathan for including the interactive art piece I designed about Jamie Faye Fenton, *Digital TV Breakfast* (2018), in the art exhibition *Chicago New Media 1973–1992*. My many thanks go to James Connolly, who led me through the Phil Morton Memorial Research Archive during my visits to SAIC, and who showed me how to use the Sandin Image Processor. I would also like to thank The Strong National Museum of Play, The Brian Sutton-Smith Library and Archives of Play, and the International Center for the History of Electronic Games for supporting my work through research fellowships I received in 2017 and 2019 that allowed me to visit The Strong's archives and collections. And lastly, my sincerest gratitude goes to Jamie Faye Fenton, who I met for the first time in Gallery 400 on a cold November day in 2018. I hold that meeting very close to my heart, and am looking forward to future conversations.

1. Jamie Faye Fenton, Raul Zaritsky, and Dick Ainsworth, *Digital TV Dinner* (1978), <https://www.youtube.com/watch?v=Ad9zdlaRvdM>.
2. Michael Betancourt, "The Invention of Glitch Video: *Digital TV Dinner*," *Millennium Film Journal* 65, no. 1 (2017): 56.
3. Jamie Faye Fenton, bio, <http://www.fentonia.com/bio/>.
4. Susan Stryker, Paisley Currah, and Lisa Jean Moore, "Introduction: Trans-, Trans, or Transgender?," *WSQ: Women's Studies Quarterly* 36, no. 3 (2008): 14.
5. Susan Stryker, "(De)subjugated Knowledges: An Introduction to Transgender Studies," in *The Transgender Studies Reader*, ed. Susan Stryker and Stephen Whittle (New York: Routledge, 2006), 11.
6. In *An Archive of Feelings*, Ann Cvetkovich writes about the affective resonances of archives as sites of loss, with emotions, affect, and trauma as ephemeral experiences unable to be contained through their institutional saving mechanisms: "The archive of feelings is both material and immaterial, at once incorporating objects that might not ordinarily be considered archival and at the same time resisting documentation because sex and feelings are too personal and too ephemeral to leave records." Ann Cvetkovich, *An Archive of Feelings: Trauma, Sexuality, and Lesbian Public Cultures* (Durham, NC: Duke University Press, 2003), 244. While Cvetkovich is writing about lesbian histories, her acknowledgment of affective loss resonates with trans history. The pointed *resistance* to documentation she writes about is of importance to my approach to trans media studies.
7. Wendy Hui Kyong Chun, *Control and Freedom: Power and Paranoia in the Age of Fiber Optics* (Cambridge, MA: MIT Press, 2008), 20.

8. This work is indebted to trans of color critique, and specifically the work of Black trans artists, thinkers, and scholars who have been critiquing the process of mediation itself through images, representations, histories, and archives, including Reina Gossett, Eric A. Stanley, and Johanna Burton, eds., *Trap Door: Trans Cultural Production and the Politics of Visibility* (Cambridge, MA: MIT Press, 2017); C. Riley Snorton, *Black on Both Sides: A Racial History of Trans Identity* (Minneapolis: University of Minnesota Press, 2017).

9. Jon Cates speaking at the Chicago New Media Symposium, November 1, 2018, available at <https://www.youtube.com/watch?v=aiPQdzO6rUI&t=5520s>.

10. Fenton writes about this on her website (<http://www.fentonia.com/bio>) and is likely comparing the Astrocade's price to other home computers released during this period, including the Apple II, released in 1977 (which sold for \$1,298), and the IBM 5100, released in 1975 (which sold for \$8,974). For more information on computer prices that year see Evan Comen, "Check Out How Much a Computer Cost the Year You Were Born," *USA Today*, June 22, 2018, <https://www.usatoday.com/story/tech/2018/06/22/cost-of-a-computer-the-year-you-were-born/36156373/>.

11. The Z80 microprocessor was released in 1976 and used for a number of computers and video game consoles, including the Bally Astrocade, its planned (but never released) Zgrass Computer Expansion, Sega Genesis and Sega Master System, and TRS-80, among others. More information about systems that use the Z80 can be found at <http://www.z80.info/z80cs.htm>, and more about the specifications of the Bally Astrocade is on Fenton's website at <http://www.fentonia.com/bio>.

12. For more on this see Michael Betancourt's very thorough history of Fenton and *Digital TV Dinner* through the lens of glitch aesthetics in chapter 1 of Michael Betancourt, *Glitch Art in Theory and Practice: Critical Failures and Post-Digital Aesthetics* (New York, NY: Routledge, 2016).

13. Recently there have been movements to reconsider methodologies for writing video game history, helmed by scholars like Laine Nooney and through scholarship published in the journal they founded with Raiford Guins and Henry Lowood, *ROMchip: A Journal of Game Histories*.

14. See for instance the history of revisions made to the *Diagnostic and Statistical Manual of Mental Disorders*. Reclassifications of queer and trans people appear in the Homosexuality Revision of 1978 in the *Diagnostic and Statistical Manual of Mental Disorders* and subsequent revisions to the *DSM-V*, with the deletion and addition of terms like "gender identity disorder" and "gender dysphoria" respectively.

15. Achille Mbembe, "The Power of the Archive and Its Limits," in *Refiguring the Archive*, ed. Carolyn Hamilton et al. (Dordrecht, Netherlands: Kluwer Academic Publishers, 2002), 20.

16. Laine Nooney, "A Pedestal, A Table, A Love Letter: Archaeologies of Gender in Videogame History," *Game Studies* 13, no. 2 (December 2013): <http://gamestudies.org/1302/articles/nooney>.

17. Of particular interest is Jonathan Sterne, "Compression: A Loose History," in *Signal Traffic: Critical Studies of Media Infrastructures*, ed. Lisa Parks and Nicole Starosielski (Champaign: University of Illinois Press, 2015), 31–54. In this

essay, Sterne chronicles the “storage and transmission” of media through signal and infrastructure.

18. Nael Bhanji, “Trans/criptions: Homing Desires, (Trans)sexual Citizenship and Racialized Bodies,” in *The Transgender Studies Reader* 2, ed. Susan Stryker and Aren Aizura (New York: Routledge, 2013), 521.

19. Of note is the first version of the Bally BASIC manual, published in 1978, whose introduction is very similar, though it begins much more focused on the programming language versus the console as a computer: “BASIC is a language designed to make computers easy to understand and use. Simple words like RUN and PRINT tell your computer what to do.” Bally Consumer Products Division, *Bally BASIC Programmed Instruction Course* (Franklin Park, IL: Bally Manufacturing Corporation, 1978), 1.

20. Dick Ainsworth with George Moses, Jamie Faye Fenton, and Brett Bilbrey, *Bally BASIC* (Columbus, OH: Astrovision, 1981), 2.

21. “The Bally Computer System” ad, Bally Alley, https://ballyalley.com/ads_and_catalogs/flyers/bally_pamphlet_1of2.jpg.

22. “The Bally Computer System” ad.

23. “The Bally Computer System” ad.

24. “The Bally Professional Arcade Plus Expandable Computer System. Now with Bally BASIC Included” sales flyer, Bally Alley, https://ballyalley.com/ads_and_catalogs/flyers/arcade_plus_flyer_page_1_of_2.jpg.

25. Thomas A. DeFanti, Jamie Faye Fenton, and Nola Donato, “BASIC Zgrass: A Sophisticated Graphics Language for the Bally Home Library Computer,” in *SIGGRAPH ’78* (New York: Association for Computing Machinery, 1978), 33.

26. It is also worth noting that ham (or amateur) radio traces back to the 1910s, and was not isolated to the 1950s, as Fenton, DeFanti, and Dontato write in their paper.

27. *Bally BASIC Manual* (1981), 71.

28. DeFanti, Fenton, and Donato, “BASIC Zgrass,” 34.

29. Dan Sandin’s Image Processor was institutionally affiliated with the University of Illinois at Chicago, which is where the analog video synthesizer was originally created, and several copies of it now exist at the School of the Art Institute of Chicago. I had the pleasure of creating live video art with James Connolly using the Image Processor during my visits.

30. *B-BASIC with DAN #1*, Phil Morton Memorial Research Archive, School of the Art Institute of Chicago.

31. *B-BASIC with DAN #1*.

32. I am indebted to micha cárdenas’s scholarship, especially “Trans of Color Poetics: Stitching Bodies, Concepts, and Algorithms,” *S&F Online*, 2016, <https://sfonline.barnard.edu/traversing-technologies/micha-cardenas-trans-of-color-poetics-stitching-bodies-concepts-and-algorithms/>, where she positions the stitch itself as a trans methodology: “The stitch is an operation of trans of color poetics that can be used to create algorithmic methods for challenging surveillance technologies and contributing to the survival of trans people of color.”