Untitled Project:
A Cross-Disciplinary Investigation of Jodi's *Untitled Game*

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I. *UNTITLED GAME* AND THE STRATEGY OF EMULATION

Launching the first program of the software-based artwork, *Untitled Game*, invokes a flash of scrolling white text on a black ground. This work by the artist duo JODI from 2001 is downloadable from www.untitled-game.org, but the artwork files have grown incompatible with the operating systems (OSs) of today through technological obsolescence. Therefore to view *Untitled Game* on an iMac from 2012 in the Rhizome offices on this summer afternoon requires an application called an emulator. The emulator bifurcates the iMac screen and software into different technological eras: inside of the emulator runs *OS 9*, an OS contemporaneous to the artwork, and outside of this, the iMac runs *OS X*, an OS from over a decade later. The artwork fills only a small window within the expanse of the 27-inch computer monitor, creating a frame around *Untitled Game* where the modern desktop appears beyond its edges. And just as this work is visually framed, so too is the experience of accessing and interacting with the artwork framed through this the use of emulation. Downloading, configuring and launching the emulator, along with sharing files between OSs, and experiencing the occasional "crash" of the emulator all become part of *Untitled Game* in the contemporary technological environment.
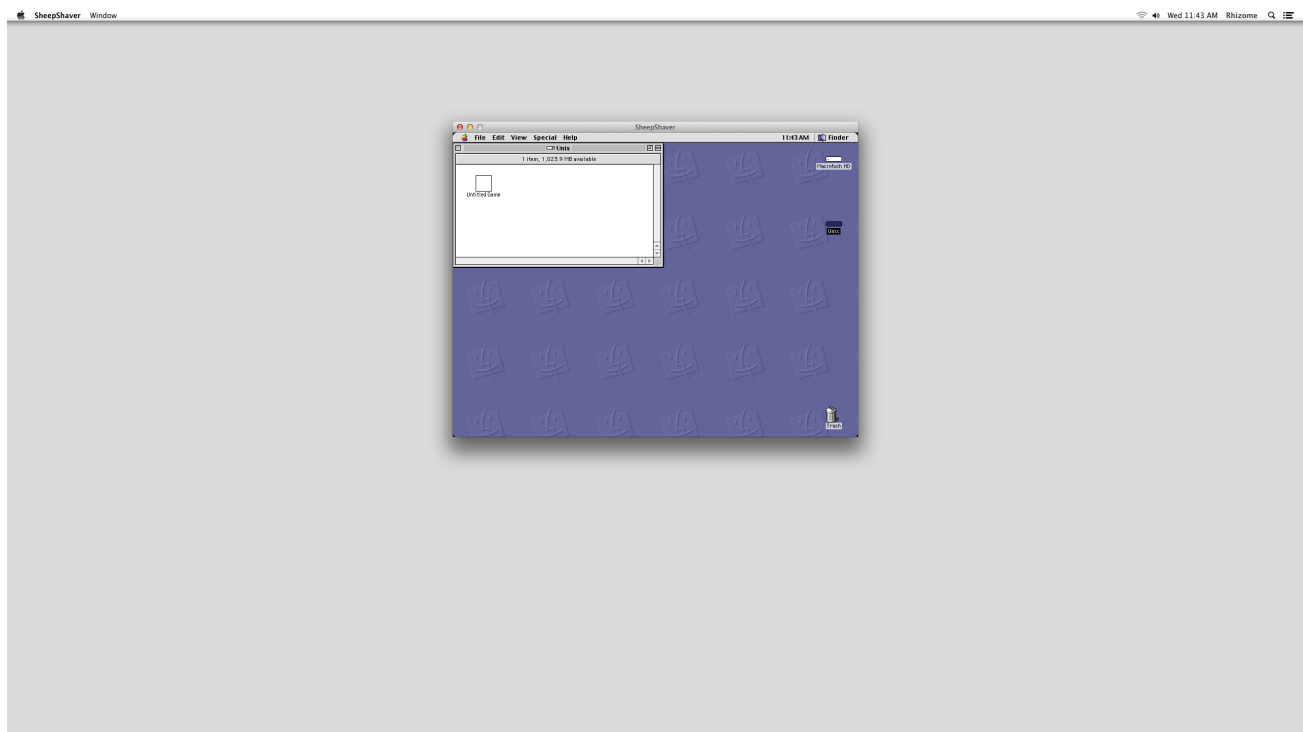
View of *OS 9* emulation software running within *OS X*.

Just as *Untitled Game* is visually framed, so too is the experience of accessing and interacting with the artwork framed through this the use of emulation. Downloading, configuring and launching the emulator, along with sharing files between OSs, and experiencing the occasional "crash" of the emulator all become part of *Untitled Game* in the contemporary technological environment. *Untitled Game* is part of the growing panoply of "legacy" software that necessitate the use of extended access strategies. Under swiftly changing technological conditions, emulation has become a wide-spread practice among many types of computer users, especially gamers who wish to continue playing beloved games of the past. Emulation also benefits from the support of the open-source community through development of freely shared software tools, such as *Basillisk*, *DosBox*, *Sheepshaver*, and many others applications through which older software can be run. These tools are dexterous and diverse, and have in recent years been appropriated into archival and conservation practices.

Although many of the same tools are shared between different groups, each grafts on its own framework for understanding and approaching the emulation practice. While all users share access as a primary impetus for emulation, conservators' considerations may well shift the focus from enhancement of graphics (a common goal among gamers) to accuracy of the total work. When considering the emulated software as a historical document and/or a work of art, such as *Untitled Game*, key variables of software emulation can be used to shape the practice including screen size, resolution, and color settings, as well as allocated RAM and bandwidth.

The search for accuracy in all forms of conservation is a decision-making process laden with subjectivity. All artworks exist in time and are subject to change, even when this change is vicariously imposed by shifts in the artwork's surroundings. Some artists may explicitly form opinions on the relationship of their art to time and change. Many other artists, however, never explicitly address these issues, refuse to or cannot make a blanket statement to govern the treatment of their artwork in perpetuity, or do not care to take on the questions of cultural custodianship for their own work. [1 a-d] In the case of JODI, no document fully articulates the artists' wishes for their work in regards to environmentally imposed change over time. [2]

What *is* clear, however, is that JODI do not hesitate to adapt their own work for various installation settings in the context

of exhibition display. In the *Street Digital* exhibition (New York, 2012) at the Museum of the Moving Image, for example, four of the twelve applications that comprise *Untitled Game*, including *Arena*, *A-X*, *Ctrl-Space* and *Spawn*, were projected on to large scrims with joysticks used to control interaction with the software. More typical views of *Untitled Game* are likely seen on personal computers around the world because the work has been publicly available for download at www.untitled-game.org since 2001. Another piece by JODI titled *Jet Set Willy Variations ©1984* (2002) was actually developed in an emulator, which JODI used to recreate the "proto-computer" environment of the *ZX Spectrum*, a very early home computer produced from 1982 to 1987. [3] This work was also featured in the Guggenheim exhibition *Seeing Double: Emulation in Theory and Practice* (New York, 2004), which compared the results of viewing computer-based works on various emulation systems and hardware configurations. This exhibition uniquely exposed the practice of emulation to viewers, and transformed it from an invisible display mechanism to a robust topic of discussion.

II. CONSTRUCTING A CONSERVATION CASE STUDY

As Conservation Fellow at Rhizome, I have selected to work with *Untitled Game* as a case study with which to test an expanded approach to conservation documentation. I do not attempt any alterations to the work, rather I use the analytical tools of digital conservation in order to closely observe it. I am looking specifically at the convergence of JODI's artistic and technical practices, and the reciprocity between these frameworks.

As I have discussed, emulation is my main strategy for accessing *Untitled Game*'s playable form, and in combination with this, I will look closely at the code of the work, while utilizing a range of sources to understand JODI's process. I will tread lightly in my chosen strategies, taking care to avoid excessive conjecture. Like a paintings conservator, I feel I can in-paint losses, but should not overlap the artists' brushstrokes with my own. I also believe in the spirit of conservation I should document my decisions, and strive to maintain a consistent logic in working with *Untitled Game*.

With these guidelines in mind, I look for a specific moment to reconstruct in the history of *Untitled Game*. This choice is a necessary part of working with emulators because in enabling earlier OSs to run, the question naturally arises: which OS? Certainly technical compatibility between the OS and the *Untitled Game* files is a key concern, but this still leaves open a range of possibilities. So, to guide my technical choices and maintain consistency, I choose not only an OS, but a keystone moment within the life of the work to guide my approach. Parts of JODI's *Untitled Game* were in development as early as 1997, and the experience of the work still shifts with every individual download from www.untitled-game.org in combination with the multiplicity of home computer configurations and access strategies to view the files. Yet, the work, in a way, is fixed to 2001 because of its release on cd-rom with *Mute Magazine's* "The Art Issue" in this year. [4] This disk is one source of the files which I analyze in this report, and was obtained directly from JODI. Another source of *Untitled Game* files used in this report is the namesake URL, which was also purchased in 2001. [5]

My goal in this analysis is to view the work with one set of period-specific parameters within the vast array of possibilities. An obvious derivation from this *Mac OS 9* reconstruction is the PC/Windows version of *Untitled Game* released by JODI on the

original cd-rom and website. Also, while *Untitled Game* is limited to a smaller supported range of operating system environments based solely on the format of the files, the possibilities of historic hardware configurations are limitless. These include a range of monitors of different sizes and qualities, and many different models of input devices such as joysticks, mice and keyboards.

This is one point where the parallels between the conservation of mass-distributed born-digital artworks and object-based conservation breaks down—there simply is no single definitive, authentic experience in the former because of its fundamental reliance on participant-side technology. Historian and archivist Robert Sakrowski and net artist Constant Dullaart make this point through their *Curating Youtube project* where they prioritize the documentation of diverse participant experiences over a single, fixed version of web-based and software-based artworks. This is done with participant videos recorded at an

Mute Magazine with the original *Untitled Game* disk from 2001.

over-the-shoulder angle and uploaded to Youtube, capturing personal computer configurations and one-on-one interactions with web-based works of art. [6] In my documentation of *Untitled Game* I not only attempt to address the artwork as it occurred historically, but also seek to record my contemporary interactions with it through my own process of documentation. Yet, I strive for a more specific mode of analysis, following a model elegantly put forward by Matthew Kirschenbaum in *Mechanisms* where he advocates for combining close "forensic" technical analysis with observation of the semiotic languages of media. [7]

III. JODI'S EARLY YEARS

Joan Heemskerk and Dirk Paesmans moved to California in 1995 through the sponsorship of an art residency at the Cadre Institute at San Jose State University. At a time when artists around the world were beginning to use the internet as an artistic medium, many in reaction against the rapidly commodifying World Wide Web, this small community in San Jose fostered artistic and experimental use of media in the self-decreed "capital of Silicon Valley"—home in the 90s to IBM's Research Laboratory, Cisco Systems, Netscape, Adobe, Macromind and Apple. Joan Heemskerk was an artist working with 3D modeling and photography after graduation from St. Joost Academie in Breda, Netherlands where she studied photography. Dirk was coming from a plastic arts program at St. Lukas in Brussels followed by study at the Royal Academy of Fine Arts in Ghent, and the Kunstakademie Düsseldorf where he studied sculpture under Nam June Paik. His most recent project at the time was *Zapp TV* (1992), a video installation displaying a rapid succession of television clips. [8]

The duo had not yet discovered the medium of the net, nor solidified their working relationship, but at Cadre they were given a small amount of server space with which to play around. This was hosted by the Internet Underground Music Archive [9] and lasted until their experimental activities caused some concern at the archive and they were kindly asked to find their own space on the web. [10] Faced with the decision of which domain name to purchase, Joan and Dirk combined their first names to form JODI, and opted for ".org," as opposed to ".com," out of fear they would be required to pay taxes or business fees as a commercially identified website. [11] Thus began an artistic partnership that has lasted for decades and continues to yield innovative, exploratory, playful and provocative works that utilize the richness of the web's networked environment.

JODI's engagement with the net started in a manner simple enough—they did not have much programming experience, but were immersed by a hyper-ecstatic tech atmosphere in San Jose. They say of this period, "We didn't have a great networking experience. We were not involved with BBSes or FTP or email or other protocols before the web." [12] Their eyes were fresh; they were experiencing the internet for the first time through the graphical and organizational interface of the WWW and the *Mosaic* (and later *Netscape*) browser. This naiveté helped JODI approach the web not only as the communication system it was designed to be, but also as a set of raw elements

for the creation of art. In this way, they were less bound to convention. From this early stage on, JODI engaged in what Jon Ippolito calls deliberate "misuse" of technology, a phrase that he coined to describe instances in art like Nam June Paik's *One for Violin Solo* performed in 1962. [13] In this action performance instead of gingerly playing the strings of the violin, Paik slowly lifts the instrument over his head and smashes it onto the table before him. The lights go up on the audience and there is a silent reverberation of shock through the theater.

Paesmans' description of the mystification and annoyance of participants visiting early JODI sites has a similar resonance: "Our first works distorted the classic page-layout by making basic errors in HTML and putting contradictory commands in the code. Many people thought our site was broken and complained." [14] Here, Paesmans is likely referring to a linked work through JODI's first URL, www.jodi.org. He calls this site a "channel" for their work, [15] analogous to the randomization of a TV, where every time a viewer tunes-in, the leading image is different. Immediately upon visiting the site, participants are redirected to one of JODI's many project URLs (the number grows over time as JODI adds work to their catalog). One of the first redirections was to www.404.jodi.org (1995), [16] which presents the HTML "file not found" error code to visitors when they first arrive; other linked pages contain message boards that run entered text through one of two filters with a Perl script—alternately one that eliminates vowels or one that eliminates consonants.

JODI'S SOFTWARE MODS

Although they may be best known for their web browser-based works, in this early period, JODI also experimented with the alteration of game code using two hugely popular computer game sources: *Wolfenstein 3D* (1993) and *Quake 1* (1996), both developed by John D. Carmack, John Romero and the team at Id Software based in Richardson, Texas. *Wolfenstein* is widely recognized as the first fully rendered three-dimensional polygon game environment, a technique that allows objects and walls to appear to wrap around the player's perspective, realistically block the player's sightline, and recede into a vanishing point that shifts with the main character/player's perspective. Characters within the game are also comprised of polygons, and sprite images occur on instances such as the firing of a weapon, scaling to suggest proximity and perspective.

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The initial development of JODI's *Quake* modifications or "mods" predates the creation of their *Wolfenstein* mod, *SOD* (1999) by several years, even though the full set of *Quake* mods was not released until 2001. *SOD* was completed while JODI were living in Barcelona, and *Untitled Game* began in San Jose just one year after the duo adopted their *nom de plume* and purchased www.jodi.org. JODI explains that one of the first mods they created was *Arena*, executed on a Mac Quadra in the San Jose Cadre Lab. [17] This mod used the Mac Shareware version of *Quake* released by MacSoft in 1997 that included just *Episode 1* of *Quake*. [18] Heemskerk used the game engine to affect graphical elements of the game, but was limited in the options she could control because she did not have the full source code. To subvert these limits, she assigned the color for all elements in the game to white, ironically producing the most transformative mod of *Untitled Game* under the most constrained variables. *Ctrl-Space* was also an early modification of the *Untitled Game* set, displayed alone on the website of C3, a Hungarian media arts organization, as a standalone work in 1998 before the remaining modifications were created. [19]

JODI appropriated the practice of game modding from video game fans, and approached the conversion of *Wolfenstein* with the purpose of transforming the game both aesthetically and conceptually. This resulted in an autonomous artwork called *SOD* (1999). The original *Wolfenstein* game world is strewn with military characters that in *SOD* become abstract features of an architectonic landscape. Using their trial-and-error process, JODI found sections of code that control graphic regions in the software and assigned these clusters of pixels to solid black, white or grey. [20] Despite the radical changes to the graphic presence of *Wolfenstein*, however, *SOD* remains linked to its former incarnation in its basic architecture, including the "game map" or the spatial arrangement of the static polygons within the game, as well as the algorithmic paths of moving components. The perspective response of the polygons maintains the same simulated first-person viewpoint of the original game, and so even though the game is stripped of all semiotic or representational content, the metaphors of three-dimensionality and immersiveness are still present.

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Like their approach to the web, JODI utilizes the game code of *Wolfenstein* and *Quake* as a raw medium for their art, approaching the practice of modification from a non-native programming perspective. To this point, the duo says of their initial mods that they were done in a trial-and-error manner, testing to see which sections of code are linked to which elements in the game. [21] JODI was not unfamiliar with the popular conventions of modding, however, because in the mid 1990s it was a popular practice among fans of computer games that was much discussed in certain circles of the web. [22] These might be called fan modifications because they are made by regular players of the games, and reflect what gamers value in the gaming experience; fan mods of *Wolfenstein* and *Quake* tend to maintain the first-person shooter dynamic, adding additional scenes or elements to extend the game in keeping with the existing concept. Small interventions called "partial conversions" or "patches" often include replacing elements of the graphics, and affecting the appearance of characters, weapons and backgrounds, but modifications can be more comprehensive and alter the function, structure, timing, space, physics, point accrual systems, and sound of the original games, as well as their appearance. "Total conversions" are complete redesigns that are unique enough to comprise an entirely new game, derivative of the original only in limited aspects of code. Both *SOD* and *Untitled Game* could be called total conversions, however, *Untitled Game* goes much further to transform the interaction experience that does *SOD*.

Wolfenstein and *Quake* are not only notable for technical gains in realistic portrayal, but also other immersive strategies that emerged as defining elements of the first person shooter genre. *Wolfenstein* uses a pair of gun-clutching hands at the bottom of the screen, while *Quake* simply has a foreshortened weapon in the perspectively implied foreground. The forward pointing weapon reinforces the directional viewpoint of the main character/player, and implied embodiment of the player within the character. With this simple visual device, the two entities merge, sharing the same sightline and implied corpus. The player thus develops a sense of his or her "presence" within the game. [23] To apply the comments of Randy Pausch's virtual reality research team to these games, their rendering and visual strategies "get users to the point where the interface becomes transparent and the user focuses on task performance." [24]

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EXISTING DOCUMENTATION OF *UNTITLED GAME*

Michael Connor's description used in the Electronic Arts In-termix (EAI) catalog (and republished from the *Street Digital* exhibition publication at the Museum of the Moving Image) describes *Untitled Game* as,

> ...a set of modifications, or 'mods,' of the video game Quake 1. [....] JODI made the piece by altering the graph-ics of Quake as well as the software code that makes it work. Their mods reduced the complex graphics of Quake 1 to the bare minimum, aiming for maximum con-trast between the complex soundscapes and the mini-mal visual environment." [25]

This description alludes to a subtractive approach, cited in other descriptions as deconstructive or even destructive, [26] but close observation of the *Untitled Game* code refutes the elimination of *Quake* elements in the modifications. EAI, The V2 Center for Unstable Media, Transmediale, The Creators Project, Rhizome, and Media Art Net, and ZKM, among other arts organizations, all acknowledge JODI as important artistic figures, yet typically focus on their other works, namely their web-based works associated which have come to share an association with net.art. Several websites present snapshots of *Untitled Game* along with brief descriptions, some make no mention of how these images were obtained or to which part of the work they correspond. [27] One video recorded at the School of the Art Institute of Chicago's "Conversations at the Edge" series shows the work in action with Joan Heemskerk of JODI at the keyboard. [28] At the time of writing, this appears to be the only publicly available video document of *Untitled Game*. It records the appearance and behavior of several mods of *Untitled Game* (along with several other computer game-based JODI pieces such as *Max Payne Cheats Only* (2005), *Spectrum* (date unknown), and *Jet Set Willy Variations ©1984* (2002), [29] though it disappointingly does not document or otherwise reveal Heemskerk's interaction with the input devices (keyboard and mouse), and thus, the relationship between the player's actions and the behavior on-screen is unclear. Certain visual details are obscured because it is shot in a low resolution from an obtuse angle, but the video does effectively record several aspects of the work, and is especially useful as a "verified" pre-sentation of the work conducted by JODI themselves.

Video still from JODI's presentation of *Untitled Game* at the School of the Art Institute of Chicago's "Conversations at the Edge" series.

Several historic mentions of *Untitled Game* also exist on the web in the archives of Rhizome and the Nettime listserve, both of which were established as spaces for critical discussion of web-based artworks in the mid-1990s. These mentions include a review of Untitled Game from 2002 by Anne-Marie Schleiner [30] and a post from JODI in 2001 that includes a section of *Untitled Game* code. On the Rhizome site "sound (self, CHAN_VOICE, "soldier/idle.wav", 1, ATTN_IDLE); walkmonster_start ();" [31] was transmitted a little over a month after the September 11 attacks on the Twin Towers in New York, and held for many an ominous impression based on its pairing of military references and systematized code language. [32] Despite suppositions to the contrary, this is an actual executable section of *Untitled Game* from the "soldier.qc" file, housed at www.untitled-game.org/progs/soldierqc.html.

IV. UNTITLED GAME WALKTHROUGH

Specifications:

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Artwork obtained from
www.untitled-game.org/download.html, June 2013

—

Viewed with *Sheepshaver* (v. 2.4) emulator software running
Mac *OS 9*

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Disk Image of *Untitled Game* cd-rom obtained with *FTK Imager*

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Host computer is a 27-inch iMac from 2011 with *OS X* version
10.8 housed at the Rhizome offices in the New Museum, NYC

A LOOK AT THE *UNTITLED GAME* FILE AND FOLDER STRUCTURE (IN *OS X*)

After an initial loading screen animation
www.untitled-game.org quickly redirects
to the first of four main pages:
www.untitled-game.org/download.html. On this page there
are thirteen files formatted for Mac *OS 9* and fourteen files
for PC/Windows which comprise *Untitled Game* along with
corresponding file sizes. Each file size is a link to down-
load a single mod. The entire set can also be downloaded
as a single compressed file for Mac or PC as "ug.sit" or
"ug.zip" respectively.

	mac OS9	pc-win
Untitled Game	36.3mb	38.1mb
A-X		2.9mb
arena	2.7mb	2.7mb
ctrl-F6	2.4mb	2.5mb
ctrl-9	2.9mb	3.1mb
ctrl-space	2.9mb	2.8mb
E1M1AP	1.4mb	1.4mb
G-R	2.3mb	2.4mb
I-N	1.1mb	1.0mb
M-W	2.4mb	2.6mb
O-O	2.3mb	2.3mb
Q-L	6.9mb	6.2mb
slipgate	3.5mb	3.5mb
spawn	2.9mb	2.8mb
v-Y	2.3mb	2.4mb

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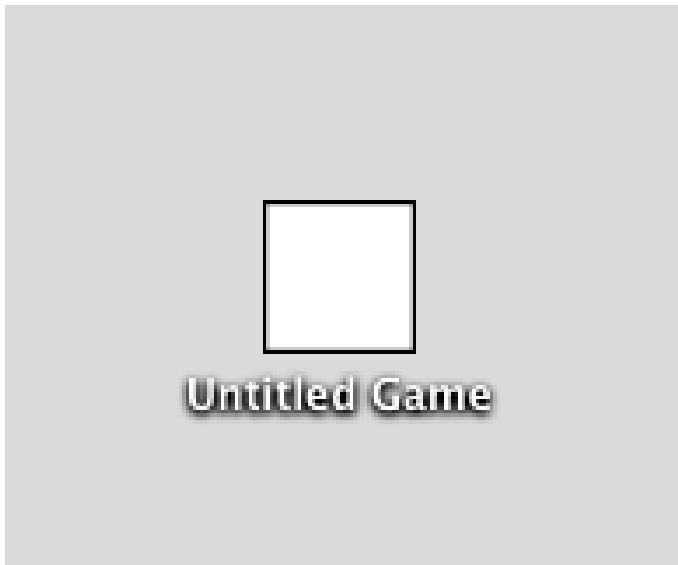
Clicking on the linked text "36.3mb" begins the download of the
Mac version, and within three minutes,
Untitled Game is on the iMac desktop. Uncompressing the file
using *Stuffit* Expander yields a directory (i.e., "folder") titled
"Untitled Game" with a white square icon bordered by a thin
row of black. This folder contains eighty-nine items that total
in size to 89.1 MB, and there are fourteen subdirectories inside
of the root "Untitled Game" directory, which display metadata
recording the date that each was last modified. These dates
range from October 20 to November 11, 2001. All of these sub-
directories lack both the conventional name and icon ascribed
in a typical graphical user interface (GUI) so that they appear in
OS X "list view" as blank rows with arrows beside them. In "icon
view" they are entirely invisible.

Inside the first subdirectory, there is a file named "Arena"
with the same white square icon as the "Untitled Game" root
directory. Although it has no file extension, the file metadata
displayed in the *Finder* software identifies it as an application.
Alongside the "Arena" file is another iconless directory named
"id1" that contains three files: "autoexec.cfg," "config.cfg" and
"pak0.pak." Returning to the root "*Untitled Game*" directory,
one finds that the contents of thirteen of the nameless, iconless
directories repeat this configuration, each containing a copy
of the "id1" directory and its contents, along with a uniquely
named application file matching the list of files from the *Un-
titled Game* website. The last of the fourteen subdirectories
contains further folders not present in the other thirteen sub-
directories titled "InputSprockets", "MacIPX", "Controlpanels",
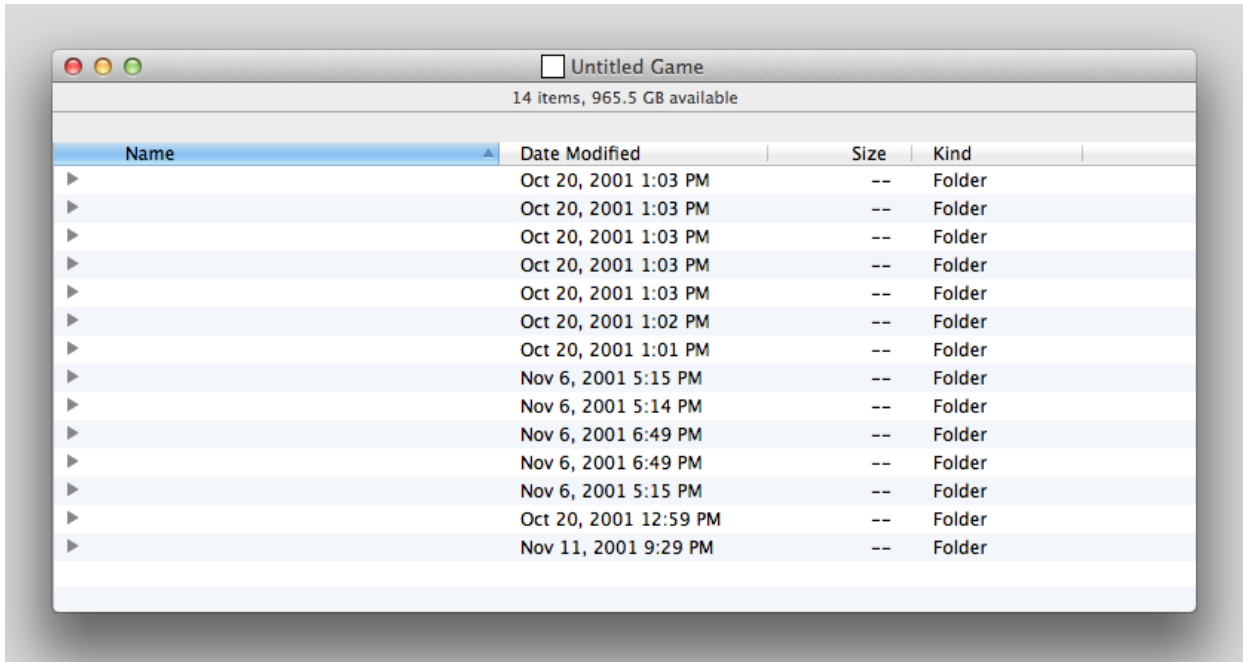
Untitled Game subdirectories in "list view," *OS X.*
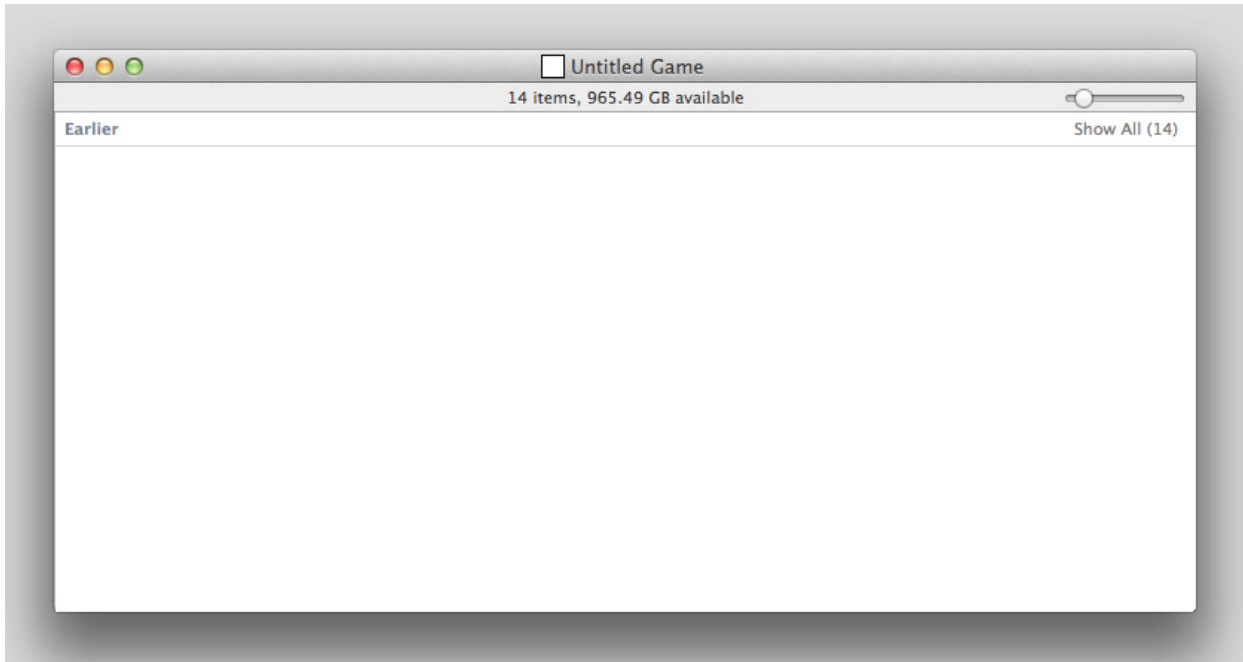
Untitled Game subdirectories in "icon view," *OS X.*

and "Extensions." These hold an application file called "Game-Sprockets 1.7.5.smi," as well as several other files that relate to input and output devices used with *Quake*. [33] With this file structure, it appears each executable mod is coupled with additional files, so the mod is not limited to a single file, but, in fact, comprises a small system of files. All of the executable files and the three supporting files ("autoexec.cfg," "config.cfg" and "pak0.pak") are dated to 2001 in their metadata, so they have all been altered by JODI after their original release with *Quake* in 1997.

There is much documentation on the web about the file structure of *Quake*, and by extension *Untitled Game*, because of the active modding community built around the game software. A crowd-sourced reference called "The Quake Wiki" provides comprehensive descriptions of the game's code, identifying the four necessary components that *Quake* mods needed to operate. First, there is the executable file, which loads the maps, models and skins, renders the vector graphics, responds to keyboard and mouse input, outputs sounds, and handles networked communication. [34] The executable files are also referred to as game engines, and in *Untitled Game* they titled *Arena*, *Ctrl-F6*, *Ctrl-9*, and so on. The next necessary component is in the "id1" folder and is called "pak0.pak." This is a compressed archive file that "contains the maps, models, programs, sounds, and skins required to play *Quake Episode 1*, *Dimension of the Doomed*." [35] Later episodes of *Quake* have package files named with progressively named ".pak" files (e.g., "pak1.pak" and "pak2.pak") therefore *Untitled Game* link to this first episode is further confirmed. The final two files also in the "id1" directory are named "autoexec.cfg" and "config.cfg" and these operate exactly as their extensions imply—they configure basic settings of the game and ascribe "key binds" or links between keystrokes or mouse clicks, and actions within the game.

The content and structure of the *Untitled Game* website also mirrors file structure thus described. All of the titles of the mods on the initial page, www.untitled-game.org/downloads, are links that lead to unique webpages corresponding to the "id1" folder of each; "arena" leads to www.untitled-game.org/ug2.html, "ctrl-f6" to /ug3.html, "ctrl-9" to /ug4.html, and so on. The contents of the folder are listed on this page for viewing and download. "Pak0.pak" is reformatted by JODI as "pak0pak.txt": a plain text file that can be viewed in a text reader. Most of the code appears as a jumble of non-human-readable characters, but certain passages stand out, including the "// character controls" section that lists key binds.

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Another legible passage lists the messages that appear on-screen during gameplay:

> …can't exist on slime alone   burst into flames   turned into hot slag   visits the Volcano God   was shot by a Grunt   was eviscerated by a Fiend   was mauled by a Rottweiler   was fried by a Dragon was blasted by an Enforcer monster_fish was fed to the Rotfish   was slain by a Death Knight   was slashed by a Knight   was destroyed by an Ogre monster_oldone became one with Shub-Niggurath   was exploded by a Vore   was smashed by a Shambler…
> [From the "pak0pak.txt" file available at www.unti-tled-game.org/pak0pak.txt]

These messages appear to be original, unaltered text from the *Quake* game-code that are clearly preserved in this section of the *Untitled Game* code.

Knowing that "autoexec.cfg" and "config.cfg" contain basic information on the way *Untitled Game* functions, one can attempt to read the code by cross-referencing each line with a *Quake* command index like the one published online on the University of Delaware's Electrical and Computer Engineering, and Computer and Information Sciences department website. [36] This index also lists the default *Quake* settings for much of the code, so comparison between the *Untitled Game* code and the original reveals the precise alterations done by JODI. Here is selected code from the "autoexec.cfg" file listing on untitled-game.org/autoexeccfg.html that illustrates changes by JODI. Combined the code with corresponding descriptions from the Delaware website for comparison, these are marked with "//" to set them apart from the operational code:

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fov "80"
> *// Default: 90. Sets the field of vision which determines how close you are to the objects.*

+mlook
> *// When mlook is active moving the mouse forwards and backwards performs a lookup and lookdown respectively.*

sensitivity "0.1"
> *//Default: 3. Sets the sensitivity of the mouse.*

viewsize "110"
> *//Default: 100. Set the screen size.*

name "-------"
> *Default: Player. Sets the player's name.*

r_drawviewmodel "1"
> *// Default: 1. Toggles the drawing of your weapon.*

r_clearcolor 255
> *// Default: 2. This sets the color for areas outside of the current map. You will really only see it if you have no clipping on and walk "outside".*

cl_rollangle 844
> *// Default: 2.0. Sets how much your screen tilts when strafing.*

sv_friction 0.5
> *// Default: 4. Sets how much friction there is.*

cl_shownet 1
> *// Default: 0. Toggle the display of current net status (Doesn't mean much to me.)*
> *Example output:*
> *98 98 120*
> *120*
> *98*

snd_show 1
> *// Default: 0. Toggles the display of sounds currently being played.*
> *Example output:*
> *255 106 zombie/z_idle.wav*
> *218 66 zombie/z_idle.wav*
> *241 89 zombie/z_idle.wav*
> *70 117 ambience/fire1.wav*

cl_bob 140.0
> *// Sets how quickly your weapon moves up and down when walking. Default 0.6. ()*

cl_bobup 140.0
> *// Default: 0.02. Sets how much your weapon moves up and down when walking.*

cl_bobcycle 4.0.
> *// Default: 0.6. Sets how quickly your weapon moves up and down when walking.*

v_kickroll 4.0
> *//Default: 0.6. Sets how much you lean when hit.*

v_kicktime 4.0
> *// Default: 0.5. Sets how long the "kick" effects last.*

v_kickpitch 4.0
> *// Default: 0.6. Sets how much you look up when hit.*

con_notifytime
> *//Default: 3. Sets how long messages are displayed when playing.*

bind ctrl "toggleconsole"
> *//Pull the console up or down - normally bound to ~.*

Clearly, there are alterations here that affect many aspect of movement and graphics, as well as multiple lines that opt to show content where it is hidden by default in *Quake*.

DIGGING DEEPER INTO THE *UNTITLED GAME* WEBSITE

Though "pak0.pak" is accessible as a text file for download at www.untitled-game.org/pak0pak.txt, this file presents an incomplete picture of the *Untitled Game* code. This compressed archive file contains key code that governs the way *Untitled Game* looks and acts, yet in a text reader the code appears as non-delimited and partially garbled so that it is not easily decipherable. Furthermore, all of the mods link to the same version of "pak0.pak" on the website, whereas the downloadable mods each have a unique "pak0.pak" file within their subdirectories. The reason for this discrepancy is not known.

Though the text file version of "pak0.pak" is not easily read, JODI fully lists on the website the programs which comprise this code at www.untitled-game.org/progs/index.html. These appear as a list of links, each descriptively titled as an entity within the *Quake*, such as "doors.qc," "weapons.qc" or "monsters.qc." This type of file is uses QuakeC code, which is a variation on the C programming language uniquely developed for *Quake*. When the title of a ".qc" file is clicked on the website, this link leads to a page with an embedded text reader and the full source code of the file inside. Within this code modified sections are identifiable because JODI have created their own file directory called "UNTITLED-GAME" and changed the code comments to reflect this change. See this section of "ai.qc" for example:

> */*UNTITLED-GAME/D path_corner (0.5 0.3 0) (-8 -8 -8) (8 8 8)*
> *Monsters will continue walking towards the next target corner.*
> **/*
> [www.untitled-game.org/progs/aiqc.html]

In this way, a page search for "untitled" flags all JODI modifications to the *Quake* code, revealing changes to nearly every program file. An additional main page on the website, www.untitled-game.org/source/index.html, lists the remaining code of *Untitled Game*, however, these sections contain no modifications by JODI.

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UNTITLED GAME IN EMULATION

After installing the Sheepshaver emulator and following the ex-
tremely helpful set-up procedure on detailed on www.emacula-
tion.com/doku.php/sheepshaver_mac_os_x_setup, a directory
is established that allows files to be shared between the native
OS, in this case *OS X*, and the emulated environment of *OS 9*.
This way, when *Sheepshaver* boots *OS 9*, a "Unix" folder ap-
pears on the desktop with contents that can be accessed in the
emulated system. Using Mactracker, an application that con-
tains information on the timeline of Macintosh hardware and
software releases, one can verify appropriate screen settings
for the emulator. Among a range of options based on technol-
ogy extant in 2001 (see earlier discussion on this date in sec-
tion II), I choose to duplicate the settings of an iBook produced
from 1999 to 2000. This choice will allow me to later compare
the results of the emulation with the experience of *Untitled
Game* on an original iBook computer, since I have access to this
hardware. Following the specifications for this model, I set the
screen size of the emulator to 800 by 600 pixels and allocate
sixty-four megabytes of RAM.

In *OS 9* the icon for the top directory of *Untitled Game* looks
the same as it did in *OS X*—a white square with a black bor-
der. Inside this are the nameless, iconless folders rendered as
they were in the later OS as blank rows in "list view." [Image
8] Highlighting these nameless subdirectories reveals that, in
fact, they are titled with a series of blank spaces (ASCII 32), and
when all are selected it is apparent that the folders are named
with a progressive number of blank spaces from 1 to 14 so
that they sort in a fixed order when organized alphabetically by
name. [Image 8] This order also matches the list on the *Untitled
Game* website. In "icon view," the folders are invisible unless
selected.

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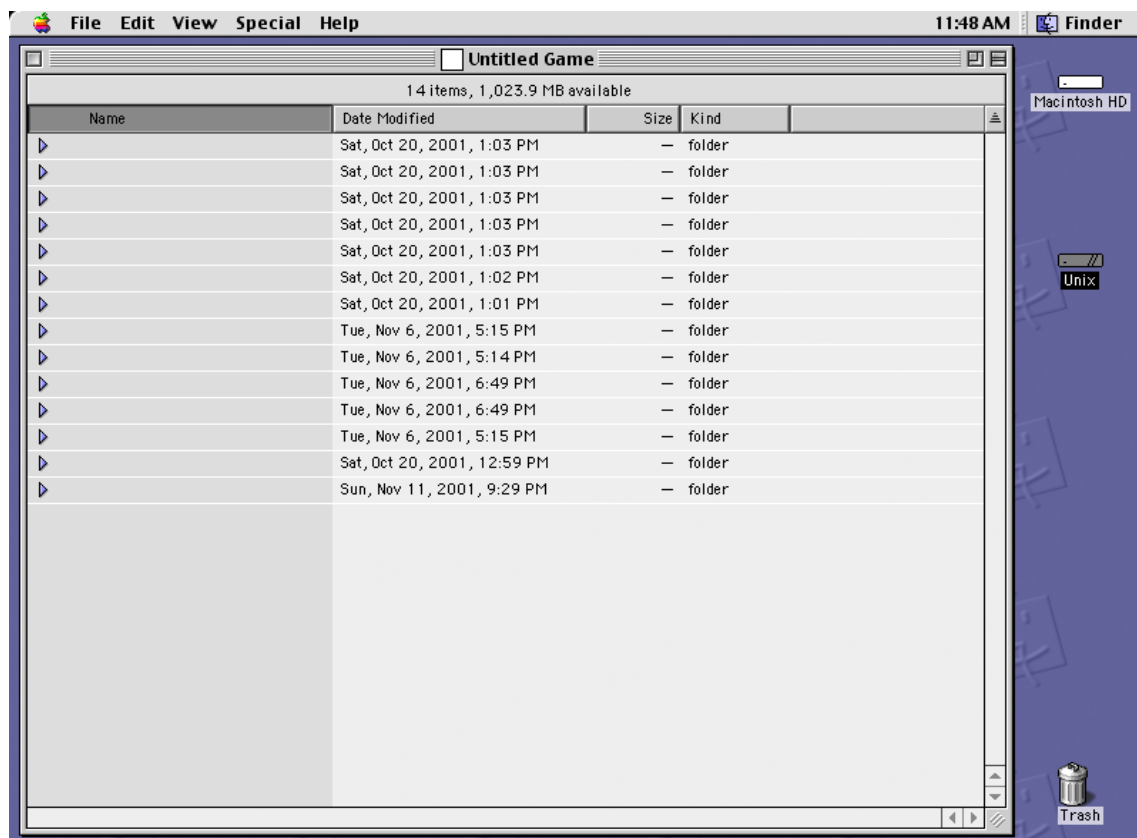
Untitled Game subdirectories in "list view," OS 9.

EXECUTING *UNTITLED GAME*, *ARENA* IN *OS 9*

The *Untitled Game* mod in the first folder named with a single blank space is Arena, which launches with rapidly scrolling text. When this file starts-up, it resizes the emulator window from the specified 800 by 600 pixels to a much smaller size. This might be explained by the "config.cfg" file of *Arena* with this line of code, which matches the dimensions of this resize:

> *vid_monitor_height "480.000000"*
> *vid_monitor_width "640.000000"*

However, in testing *Untitled Game* on the iBook hardware (also running *OS 9*) *Arena*, along with all of the other mods, actually resizes to full screen upon launch, rather than becoming smaller as is the case within this emulator.

Inside the emulator, the quick-moving text of *Arena* lists a number of start-up operations and settings that are activated upon launch. These read:

Sound Sampling Rate: 11025
CD audio initialized
Input Sprockets initialized.
Execing quake.rc
Execing config.cfg
Execing autoexec.cfg
3 demo(s) in loop
Version 1.08 server [64638 CRC]

This text soon gives way to an all-white screen with a black bar at the bottom and three groups of digits in white: "0 0 250." [Image 9] The soundscape, meanwhile, clambors with groans, grunts, chainsaw noises and explosions; distant-sounding and rhythmically panning left-to-right, they seem to circle like a pacing predator. The noises elicit a sense of foreboding spaciousness within the white screen—the absence of imagery makes *Arena* a void filled only with projected anxieties of an imminent virtual death. I approach *Arena* knowing that it is a modification of *Quake*, yet as a casual gamer driven more towards adventure than action games in my adolescence, I have little direct experience to apply besides a general lexicon of common key commands.

I strike the arrow buttons on my keyboard: no visible change. I try *spacebar, return, shift, alt/option*, and *control* in various combinations to activate a change in *Arena*, and find the spacebar produces a "huh" sound on press. I gather that this is the sound of my own voice as an entity within *Arena*, and from the tenor I glean that I am a deep-voiced man exerting some action like a kick on the *spacebar* command. The *return* key and left mouse click make the sound of an explosion; since I have control of this effect I assume it represents the use of a weapon. The *shift* key pulls down a menu from the top of the screen with running columns of digits. *Option* brings down a similar menu with the visible word "server" listed repeatedly. *Control* pauses the game and pulls down a similar readout with a blinking cursor, which suggests a space for text input.

A quick web search for "*Quake* commands" takes me again to "The Quake Wiki" where I find an extensive listing of console commands for the software described as "cheat codes." Some of the more powerful commands for *Quake 1* include "god" with which "the player becomes invincible" and "fly" that allows the player to "fly instead of walk." [37] Both can be activated in *Arena* and are received in the command prompt with the re-
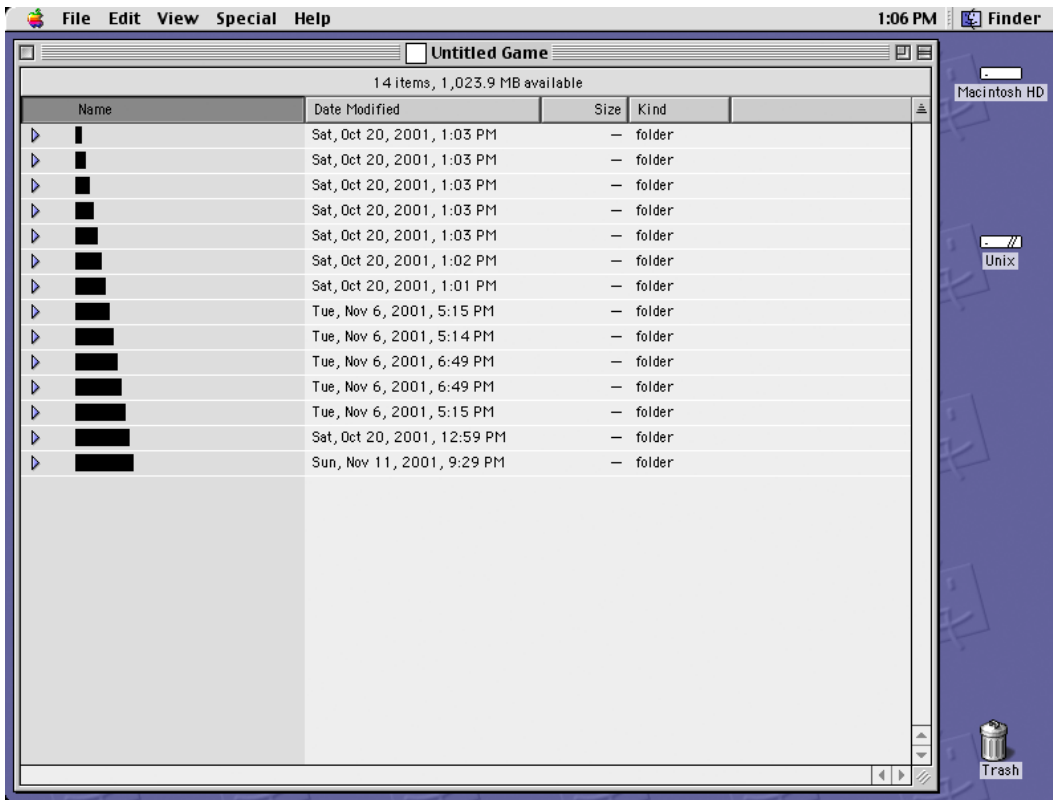
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sponse "GODMODE ON" and "FLYMODE ON" respectively. The results of "flymode" are not perceptible in the white screen of *Arena*, but "godmode" halts the decline of the central number in the black bar at bottom, and appears to forestall the death that otherwise comes quickly (for me) in *Arena*. [35] Without "godmode" activated I received a variety of death messages upon repeated sessions with *Arena*, including "-- JOINS THE ZOMBIES," "-- WAS DESTROYED BY AN OGRE," "-- WAS SLASHED BY A KNIGHT," and "-- WAS SMASHED BY A SHAM-BLER." [38]

Within *Arena* participants receive messages directly from an omnipotent voice that appears as text inside a pop-up window, including notices like "YOU GOT THE CELLS" or "YOU GOT THE ROCKETS." In the undefined space of *Arena*, these come as a surprise. They are remnants from the appropriated original, and share the same combat-zone imagery as the soundscape.

REFLECTIONS ON *ARENA*

Besides the sporadic messages in *Arena* and the space of the command prompt, the white screen of *Arena* is unflinching. Yet, upon repeated sessions with *Arena*, it becomes clear that the messages are linked to consistent locations within the environ-ment, indicating a fixed spatial arrangement and the presence of a sitemap.

This belies a fact that JODI's Joan Heemskerk confirms: all

of the elements from *Quake* are present in *Arena*, including a fully rendered 3D space. They are invisible simply because they are devoid of value and hue. [39]. This includes the presence of polygonal walls that restrict navigation and respond perspectivally, as well as the files linked to the presence of objects and characters within the game. The sounds of *Arena* are also remnants from *Quake*. For experienced *Quake* players, these likely trigger a (muscle) memory, or as Anne-Marie Schleiner describes it in a review posted to Nettime in 2001, a visceral invocation as well, "These original audio samples recall indexically in the player's minds eye the original *Quake* levels and characters. A ghost image of the original flickers behind the alteration, evoked by sound and interface artifacts." [40] Another artifact as such is the black bar at the bottom of the screen, which remains as a stripped version of the "dashboard" in *Quake*. Noticeably absent, however, is the iconic foregrounded weapon of *Quake* (more on this later).
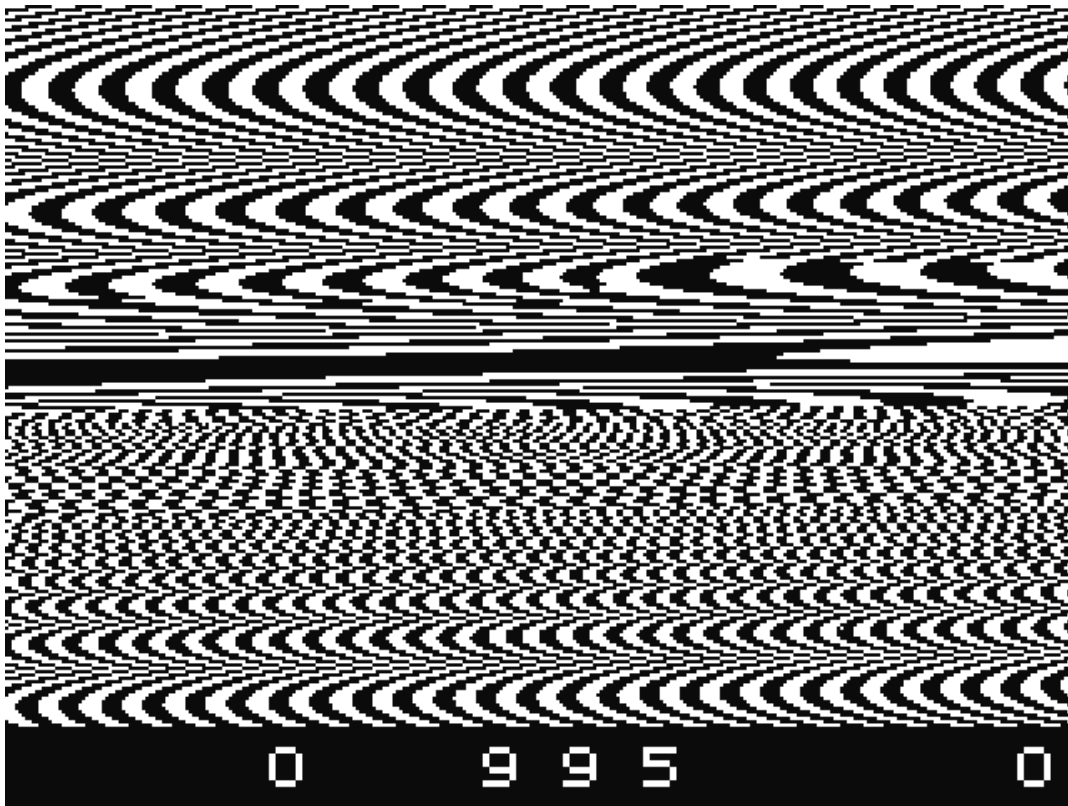
As an unfamiliar *Quake* gamer severely impaired in navigation by the stripped visuals of *Arena* doubt sets in and I repeatedly meet my virtual death. I begin to question if my input has *any* effect in *Arena* as I find myself attempting to interface with software that challenges the basic premise of control that seems implicit in interactivities spaces. Without clear responsiveness to my actions, my frustration mounts and my will to engage with *Arena* wanes. What I've found upon reflection is that this is ultimately at the heart of JODI's transformation of *Quake*. *Arena* is no longer a game in the true sense where consequences and rewards are clearly defined.

Start-up screen of *Arena* as seen in emulator.

V. A FORMAL OVERVIEW OF *UNTITLED GAME* UTILIZING OBSERVATIONS FROM CAREFUL EMULATION

△ *rena*, *Ctrl-F6*, *Ctrl-9*, *Ctrl-Space*, *E1M1AP*, *G-R*, *I-N*, *M-W*, *O-O*, *Q-L*, *Slipgate*, *Spawn*, and *V-Y*: these are the names of the 13 mods that comprise the Mac version of *Untitled Game* (additionally there is A-X for PC only). [Image 11] Each confronts 3D space in its own way expressly through strategic tactics of code modification.
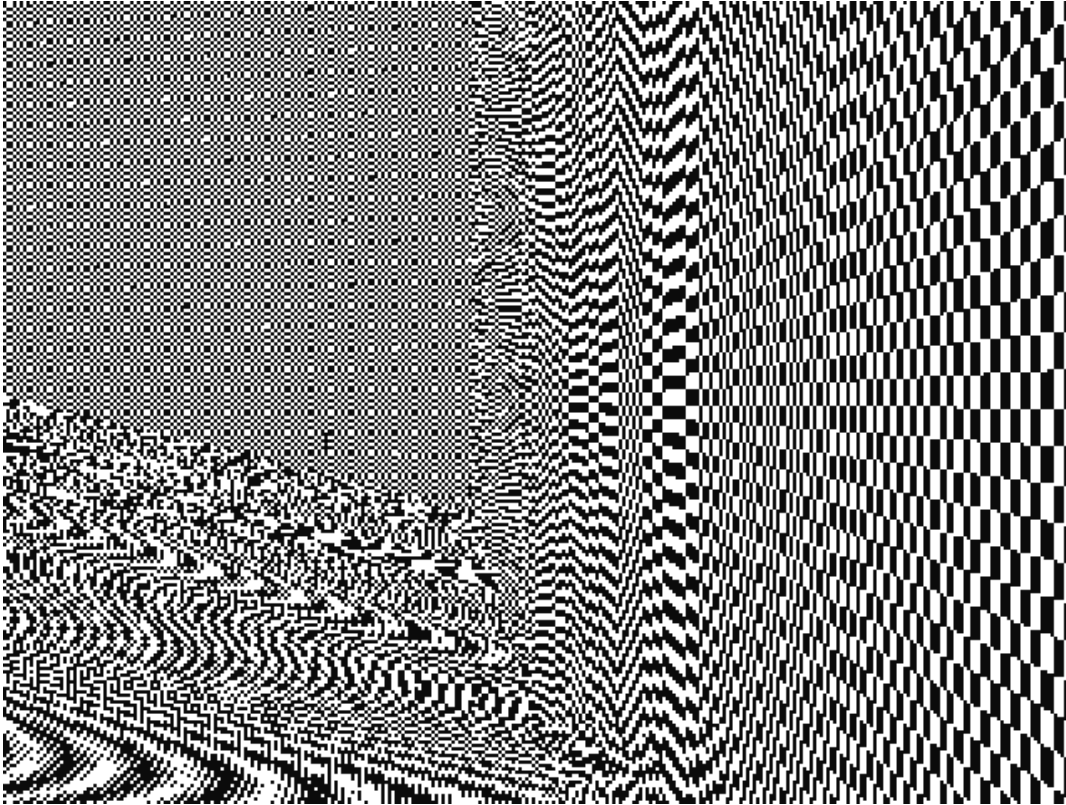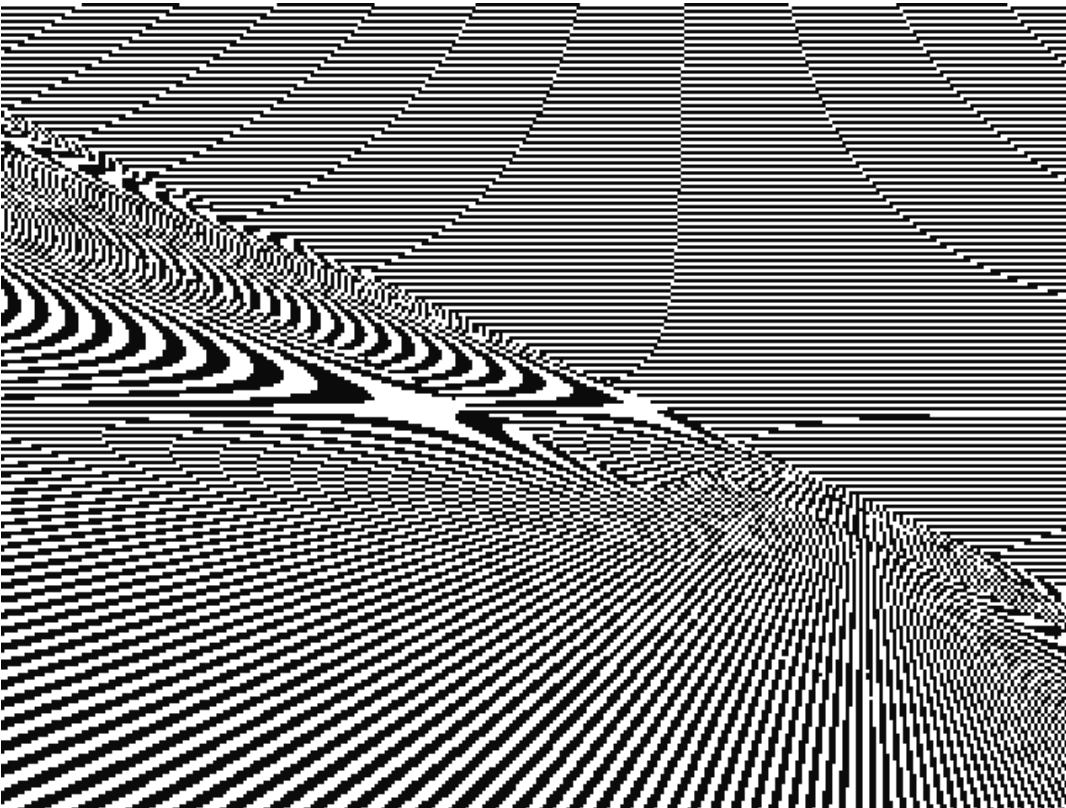
OP MODS: *CTRL-F6*, *CTRL-9* AND *CTRL-SPACE*

Screenshot of *Ctrl-F6* as seen in emulator.

Screenshot of *Ctrl-9* as seen in emulator.

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Screenshot of *Ctrl-Space* as seen in emulator.

Three of JODI's mods can be grouped together in their use of strong chiaroscuro graphics that are strictly comprised of black and white pixels. I will call these the "Op Mods." As Michael Connor describes, "The more psychedelic 'Ctrl-Space' […] features a swirling black-and-white background. The game engine generates this effect as it continuously tries, and fails, to visualize the interior of a cube lined with black-and-white wallpaper." [41] In fact, the graphics of both *Ctrl-F6* and *Ctrl-9* behave similarly to *Ctrl-Space* as well, because all three utilize the graphical phenomenon of temporal aliasing.

Anti-aliasing may be a more familiar phrase to most than aliasing because of the long-standing fight in computer graph-ics research against the effect. Several techniques are used to combat aliasing, including various sampling filters such as box, triangle/tent and Gaussian, which many may recognize as al-gorithms used to apply "blur" to images. [42] These are used in anti-aliasing to remove "jaggies" or jagged edges in computer graphics. When time is introduced as a variable in computer graphics, the slight differences in aliasing between consecutive frames of animation cause can cause "crawlies," where "edges and lines may ripple [and] texture-mapped regions […] scintil-late like a tin-foil blizzard." [43]

The crawlies create the psychedelic effects to which Michael Connor refers in his description of *Untitled Game*, including the hypnotizing moiré patterns that arise from the movement of adjacent patterns in *Ctrl-F6*, *Ctrl-9* and *Ctrl-Space*.

JODI explains that the binary color scheme in these mods de-rives from the composition of the gamecode, where alternating rows of pixels are defined separately. [44] This is a function of Quake's pioneering combination of scanline rendering (where one pixel row is drawn at a time) with Z-buffering (a system which manages the coordinates of depth in 3-D graphics) to create skinned textures on polygonal shapes within the game. [45] JODI's choice to utilize a color scheme of black and white creates maximum contrast, and therefore enhances all of the phenomena that occur within the mods' graphics.

Optically, the graphical effects of *Ctrl-F6*, *Ctrl-9* and *Ctrl-Space* rely on similar perceptual phenomenal to the works of several Op artists of the 1960s. Sections of *Ctrl-F6* closely recall the painting *Movement in Squares* (1961) by Bridget Riley, which consists of a black-and-white checkerboard constructed on a grid that narrows laterally toward the center of the canvas. Ri-

ley utilizes a warped grid which creates the illusion of receding space between two rounded columns. This depicts, in geometrical terms, the perspective (perceptual) view of a Cartesian grid with equidistant units transformed in space. [46] The radiating moiré patterns and scaling grids in JODI's Op Mods create the same effect of undulating space.

In *Untitled Game* this is enhanced even more by the constantly shifting perspective of the work's first-person view, as well as the temporal element of the code cycling through rendering processes in real-time. Francois Morellet's kinetic artwork Four Self-Distorting Grids (1965) similarly explores optical phenomena in time a space. Displayed along Riley's *Movement in Squares* at the seminal Op Art exhibition "The Responsive Eye" (MoMA, 1965), Morellet installed four rotating grids on poles attached to motors. These grids interacted visually as they turned in a remarkably similar way to the juxtaposed grid-based patters of JODI's op mods. Though the patterns in *Ctrl-F6, Ctrl-9* and *Ctrl-Space* are not transparent, they visually interact at the edges of polygon models where the patterns meet at different points on the Z plain. The optical phenomenon of afterimage also leads to the illusion overlapped patterns in these mods as the grids rapidly shift position within the space.
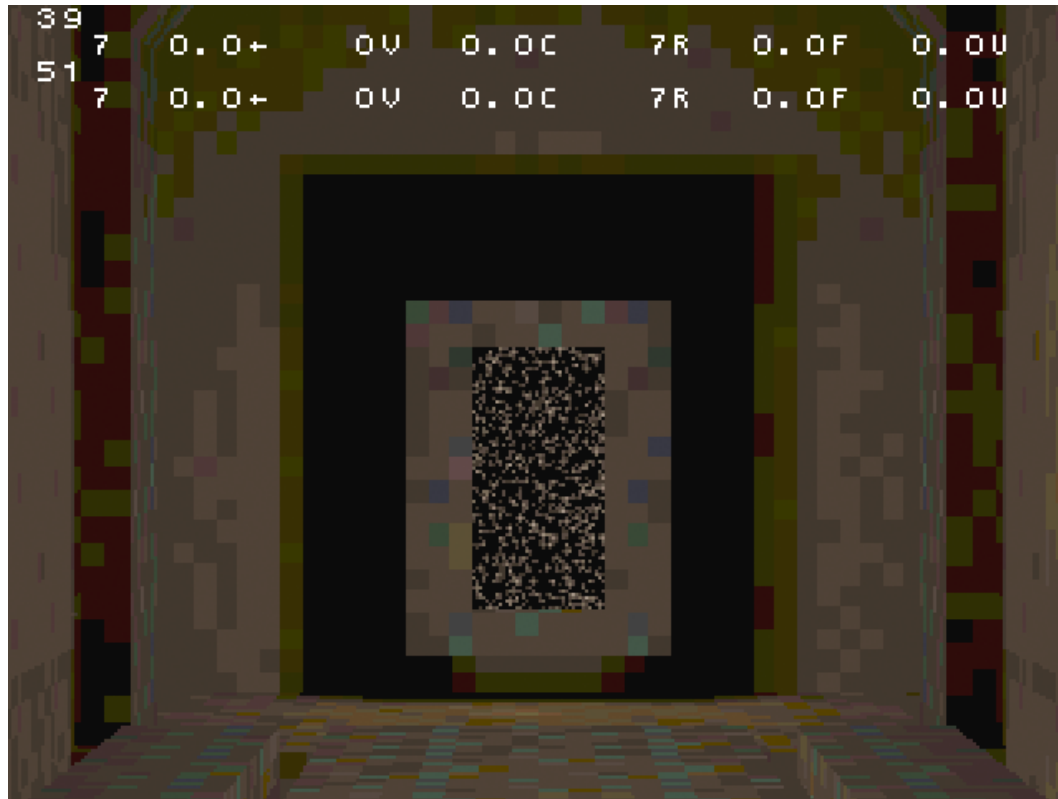
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ALTERED MOVEMENT MODS: *E1M1AP, I-N* AND *Q-L*
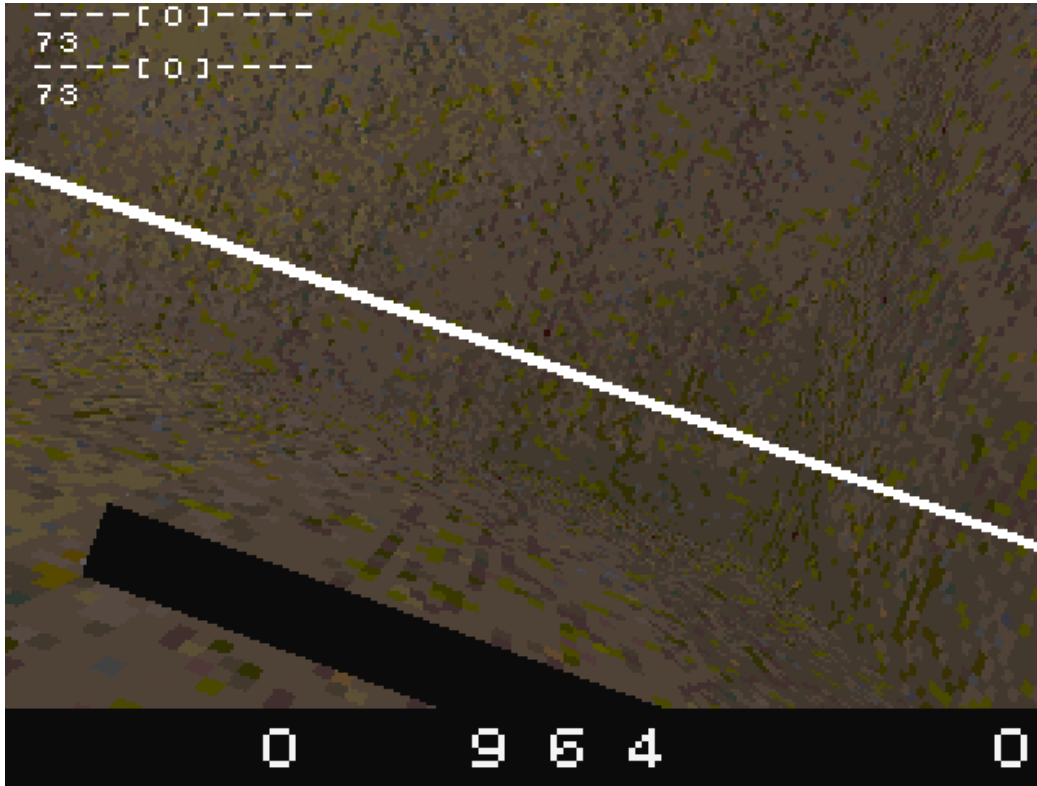
Screenshot of *E1M1AP* as seen in emulator.

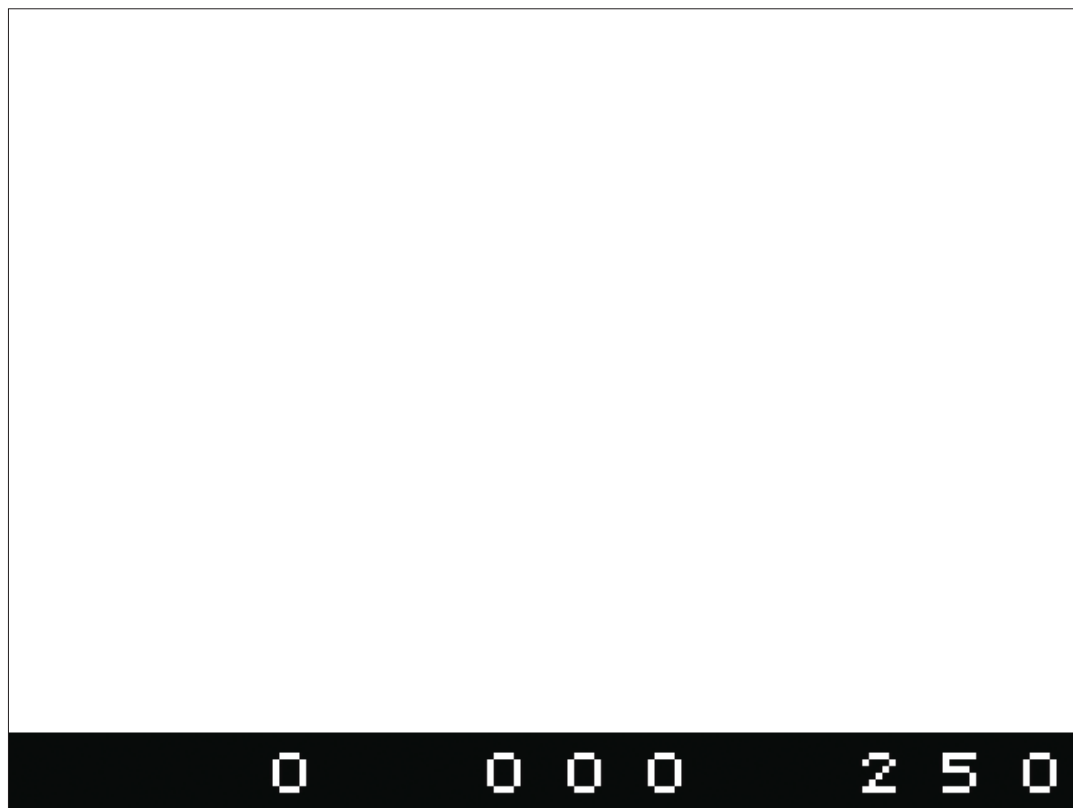Screenshot of *I-N* as seen in emulator.

Screenshot of *Q-L* as seen in emulator.

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The next group of mods maintains the graphic environment of
the original Quake game, yet distorts movement through the
space by altering elements of the code that govern camera
angle. For example, the element of code "cl_rollangle" has a
dramatically different value in the configuration file ("autoexec.
cfg") of *E1M1AP, I-N* and *Q-L*. This causes the camera angle
spin 360 degrees in all three mods, thus confusing the implicit
connection between the camera angle and the implied per-
sonage of the first-person viewpoint. While the environment
remains representational in its depiction of underground cor-
ridors relating to the narrative of the original *Quake 1, Episode
1* story, JODI's alterations abstract this premise through their
disruption of the movement (how can the viewpoint be that of a
person when it spins so wildly?)

COLORBLOCK MODS: *ARENA, G-R, M-W, O-O, SLIPGATE, SPAWN* AND *V-Y*

Screenshot of *Arena* as seen in emulator.
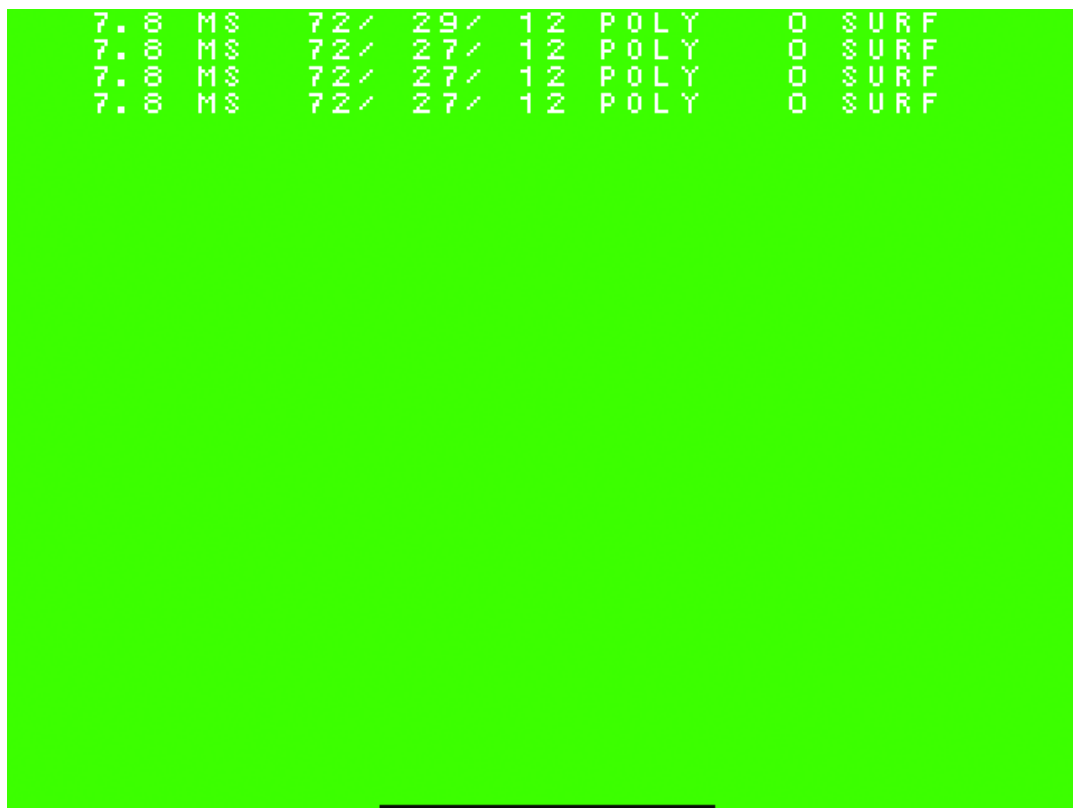
Screenshot of *G-R* as seen in emulator.

Screenshot of *M-W* as seen in emulator.

Screenshot of *O-O* as seen in emulator.
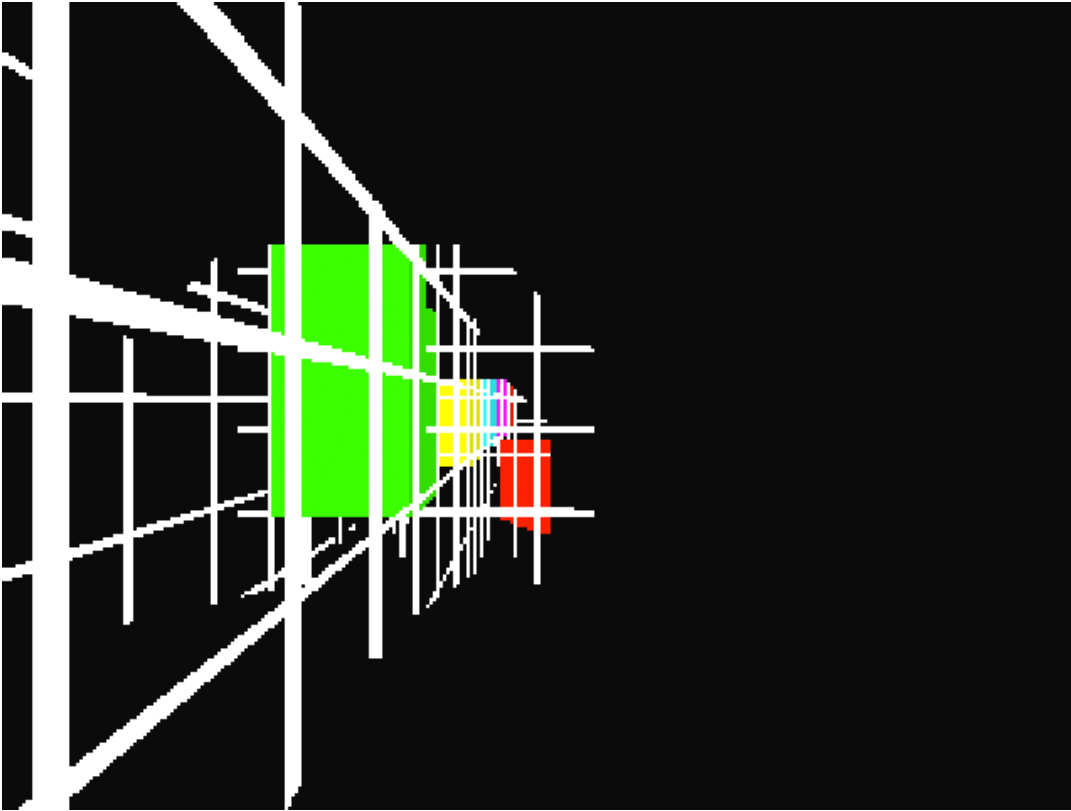
Screenshot of *Slipgate* as seen in emulator.

Screenshot of *Spawn* as seen in emulator.

```
46
   7.8 MS  373/226/  84 POLY     O SURF
46
   7.8 MS  373/226/  84 POLY     O SURF
```

```
   O       O       O       O

         O       9 9 4              O
```

Screenshot of *V-Y* as seen in emulator.

Arena, *G-R*, *M-W*, *O-O*, *Slipgate*, *Spawn* and *V-Y* consist of entirely flat planes of color with no texture-wrapped objects or lighting. Lighting effects and skinned textures were used in *Quake* to add atmosphere and to help guided players navigate through the gamemap, so the elimination of these elements leads to the abstraction of movement through the space. While *O-O* , *Slipgate*, and *V-Y* maintain some visual reference to perspective lines, *Arena, G-R, M-W*, and *Spawn* appear remove all indications of 3D space. In both cases, the abstraction is executed through removal of all lighting effects, likely implemented through a command such as "r_fullbright," which removes highlights and shadows, and sets colors to their brightest possible appearance. Textures on both the spatial environment (walls and floor) and moving entities within the mods are also devoid of texture, which could have been done through the "r_drawflat" command. This renders all polygons as flat planes of color with no pattern. I cannot confirm the use of either technique in JODI's code, but they both are likely solutions. In the "flat" colorblock mods (*Arena, G-R, M-W*, and *Spawn*), the environment and all entities within the game are skinned in the same flat color, thus removing any visual differentiation between the two. In these, the gameplay is the most radically altered of all the *Untited Game* mods because the total absence of spatial information renders movement within the work completely unknown. The only indication of space and location in these mods is provided by sound effects, which are equalized according to the associated source coordinates within the gamemap.

VI. MEDIATED ART AND CONSERVATION IDEOLOGY

Lisa Gitelman summariezes some of the complexities of communication technology that have fascinated artists over time, "Even media that seem less involved with representation than transmission [...] offer keenly persuasive representations of text, space/time, and human presence, in the form of code, connection, and what critics call 'telepresence'..." [47] These themes are present across all communication technologies, yet each medium distinctly shapes the information it transmits into a "vernacular" language. [48] This techno-vernacular is a semiotic system that allows humans to communicate both directly to machines, and *through* machines. A dispatched email, for example, only arrives in an inbox after a careful "reading" by the inbox itself. Such is the deep interconnection between us and our media, and between human and machine languages.

In terms of mediated art, it is imperative to understand the specific affordances [49] of a medium when interpreting the content it encodes. This requires close technical study along with the conceit that any aspect of the machine, the medium or the code can be artistically purposed: as a tool for production, as a means for display, as a mode of distribution, as storage space, as an artistic medium, as a conceptual platform, as an actor in performance, etc. Some of these modes fall under Jon Ippolito's characterization of artistic "misuse" of technology, [50] while others fit technical conventions, yet these parameters aren't enough to define the "boundaries" of an artwork in a mediated/networked context—the only way to do this is by understanding the functionality and intent behind an artwork, as well as the gray area in-between where the artist communes with the tools in a subjective, sometimes emotional way.

Art in a networked context admittedly complicates the task of establishing the boundaries of a work, however. This complication is important because it forces art historians and conservators to acknowledge that this demarcation may only be a function of our own practices, not necessarily the artist's. Well-meaning actions toward preservation can go against the guiding principle of artist intention by imposing external parameters set by institutionalized scholarly, scientific, museological, commercial, archival or art historical systems. One much lamented example of this is the removal of web-based artworks from their active networked environments, which can threaten the functionality of the work, and also endanger its conceptual basis and artistic meaning [51].

Media scholar Pau David Alsina Gonzalez breaks down the various depths of computer functions thusly:

> There are different levels of representation inside [...] computers: there is the physical system (a structure of integrated circuits), the logical system (the interpretation of high/low voltage as 1/0), the abstract system (patterns of 0/1 may represent alphanumeric characters, commands may stand for whole sets of logical instructions), and conceptual system (software applications programmed with programming languages). [52]

So, to problematize my own directive if we use technical function combined with artistic intent to guide conservation practice, there is truly no way to separate top-level "conceptual" software functions from underlying computer systems. [53] As preservationist Robert Sakrowski puts it, "Net-based art activities are [...] geared toward their respective hardware and output options. They are always conceived at a particular time, for the performance and output devices in use at that time." [54] Therefore, when we consider a web-based artwork's technical function and artistic intent, we must also accept the inextricable temporal links that both these aspects embody.

Conservators are well aware that our technical landscape is perpetually shifting, causing "decay" [55] to creep in surprisingly quickly in the form of link rot, outmoded plugins, newer browsers that display the work based on different algorithms, and file types that go out of fashion. Digital conservator, Ben Fino-Radin identifies three areas of decay in new media works: breakdown of diffusive links, data obsolescence, and physical degradation. [56] Artist intent is also temporally linked because, of course, one can only define meaning based on their present understanding. So, to resurrect a statement of intent in a different time is an inherently complex, interpretive action that requires conjecture on the behalf of the cultural custodian. These leaps then, require an even broader scope of consideration that pulls in a media-historical approach construing mediated artworks not as objects, but as a series of experiences in time.

NOTES

1. The following is a small sampling of the vast array of conservation issues that from conservator's attempts to understand the way various artists' works relate to change. Briefly described here are the works of a) Donald Judd; b) Sol LeWitt; c) Robert Irwin and d) Joseph Beuys:

a. Donald Judd was highly concerned with the installation and care of his works, leaving detailed instructions and copious notes to guide these processes in the future. However, as conservator Eleonora Nagy explains, the artist never gave direct comment on the passive effects of aging on his artwork (manifesting physically as "patina"):

> *No statement written by Judd is known that would answer this question [of patina]. I've had a lot of discussions with Judd's assistants, fabricators and friends about this, particularly with Dudley Del Balso, who was probably Judd's most organized, long time assistant, [and] who was noted for her excellent record keeping. Also, I had long chats with Stockebrand (his partner and a principal Judd scholar). James Dearing also shared with me his understanding of Judd's thoughts about conservation issues.*

> *They concur that Judd expressed several times that he is not against natural, even patina as it relates to the graceful aging of his artworks. What he really disagreed with and always got terribly upset about were damages: scratches, fingerprints, and dents that come from handling or ignorant treatment of his works. Mishandling his works made him very upset and he complained about this even in his writings.*

> Eleonora Nagy interviewed by Richard McCoy, "No Preservatives | Preservation, Perfection, and Patina: Eleonora Nagy Discusses Conserving Judd's Art," last modified June 29, 2011, blog.art21.org/2011/06/29/no-preservatives-preservation-perfection-and-patina-eleanor-nagy-discusses-conserving-judds-art/.

b. Conservators hold a discussion on Cons DistList about the care of a Sol Le Witt wall drawing. The struggle over fundamental interpretive decisions here suggests a lack of documentation of the artist's wishes. Also noteworthy is the parallelism between LeWitt's instructions-based artworks and the code-based works of JODI.

> *In response to the comments of Chantal Bernicky (Conservator at the Carnegie Museum of Art), Berit Moller (Paintings Conservator, Rosenborg Palace, Copenhagen) writes:*

> *What is it that they want to preserve? The actual physical work of art, the physical work as documentation of the event (the assistants interpretation of the instructions by LeWitt) or the knowledge of it.*

> *Sol LeWitt's works of art, as you say, are based on statements and instructions and are executed by assistants. They form a certain expression that is due to the way they interpret the LeWitt statement.*

> *The question now is an other [sic] matter: Why try to save something that is a copy of the original work?*

> *I think the original decision makers must go back to the drawing board and restart the discussion because the conservation problems described regarding the art work [sic] is now completely different since it is no longer the original work.*

Jonathan Kemp [Senior Sculpture Conservator at the Victoria and Albert Museum] ←stutterer→ writes in response:

> *As you've outlined above, this is actually not the question as LeWitt was interested in instruction sets viz. instructions to others from which to make products--and so such works are allographic rather than autographic [think of a musical score and its rendition in different performances, rather than a singular work]. Thus it seems to me to be in keeping with LeWitt's ideas to restore the drawing and, by executing the usual procedures of material analysis to determine with what to restore it with, the idea of 'instruction set' is simply extended, with all decisions added to the record (or 'specification sheet').*

> "Re: Sol LeWitt Wall Drawing," Cons DistList, last modified August 24-26, 2008, cool.conservation-us.org/byform//mailing-lists/cdl/instances/2008/2008-09-07.dst.

c. Artist Robert Irwin sits down to a discussion with Objects Conservator Richard McCoy at the Indianapolis Museum of Art. McCoy asks a very specific question about the inevitable need to

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deal with the obsolescence of the fluorescent bulbs used in Irwin's installation called *Light and Space III* at the museum:

Author's note: this a brilliant and subtle commentary from Irwin worth watching in its entirety. His point on "site-conditional" works is especially acute as well.

[Video 35:25]
RM: *...what if we couldn't get the T12 bulb? Is there another kind of thing that we could put there?*

RI: *I don't know the answer to that, but I have a riddle for you that puts it into context.*

When the abstract expressionists painted their paintings, you know, let's say Franz Kilne [...] Art historians were on one level really pissed off because they said, 'oh, this paint it's in fifty years or whatever, it's just all gonna peel off, ok, it's just not gonna last.' Going back to a time, say, when people did egg temperas [...] That stuff was made to last as long as possible, and people cast things in bronze made to last [...] and it's not an accident they did that. At that point in time one of the thrusts of art, one of the concepts that people were really entertaining in their religions and their lives was this idea of transcendence. The idea that it transcended our death, it transcend our time. And we have built this entire concept of history based on this idea of this transcendence. [...]

If you look at the history of art, it's never stood still. All those methods, all those techniques, as good as they were, as brilliant as they were, somehow didn't make sense in the next generation, and the generation after that. So, we've come to a point where, say, Franz Kline does this thing, and one can say, well, it's not gonna last the way those other things lasted, and he's basically saying it's not supposed to last. [...] Transcendence is a wonderful, beautiful idea, but it's not real, it's not the world we really live in. We live in a world that's in constant change and constant flux and chances are we don't transcend it in any way, and that our mark on the earth doesn't transcend it. Now, we can debate this philosophically, but there's an honesty in that material [...]

> Robert Irwin interviewed by Richard McCoy, last modified Dec. 19, 2012, www.youtube.com/watch?v=JCh8s10f2ws.

d. Rachel Barker and Alison Bracker's Beuys is Dead: Long Live Beuys! Characterising Volition, Longevity, and Decision-Making in the Work of Joseph Beuys contains fascinating discussion on the radical decay that several Beuys works have undergone due to their inherently unstable composition. The artist's Felt Suit (1970) has deteriorated so severely that it has been deaccessioned by the Tate, and sequestered to their archives, barred from the possibility of public display—ever.

Two main testaments lead to this decision: the statement of the artist's wife, Eva Beuys, and the recollections of conservators who worked with Beuys when he was alive. Ms. Beuys stated:

It is with some difficulty that I state – in the name and from knowledge of Joseph Beuys – that for reasons to do with copyright and individual rights Felt Suit, belonging to the Tate Gallery, must sadly never be shown again in any location, on any occasion and in any context, however constituted, including for the purposes of study.

For historical purposes it should continue to be recorded that the Tate Gallery possesses such a 'Felt Suit'. For that remains an asset of the Tate Gallery.

Conservator Christian Scheidemann recounted:

If ... damage was unavoidable, he would have accepted it. With the felt suit we have to deal with an edition. The edition would carry a mission – and that was to keep the body temperature of the respective person and to keep him spiritually active. The suit was not about the decay ... he was not at all interested in the uncontrolled decay – unless it was unavoidable.

> Barker, Rachel and Alison Bracker. "Beuys is Dead: Long Live Beuys! Characterizing Volition, Longevity, and Decision-Making in the Work of Joseph Beuys," Tate Papers, last modified 2005, www.tate.org.uk/download/file/fid/7404.

2. "Degradation" is another way to describe these changes, but this term connotes a negative association.

3. As described by Dirk Paesmans in the video recorded at the School of the Art Institute of Chicago's "Conversations at the Edge" series.

School of the Art Institute of Chicago, "Conversations at the Edge," last modified 2006, vimeo.com/10646976.

4. *Untitled Game* cd-rom distributed with *Mute Magazine*.

 "The Art Issue," *Mute Magazine*, December 2001, 22.

Note: Two other JODI works, *All Wrongs Reversed* and *OSS/*****, were also distributed on cd-rom.

5. The WHOIS Database contains information required by the Internet Corporation for Assigned Names and Numbers (ICANN), including basic details about the URL and some personal information about the creators. For www.untitled-game.org, it records that the URL was created on July 27, 2001 by Joan Heemskerk from Barcelona, Spain.

"WHOIS Results for www.untitled-game.org," WHOIS Database, June 2013, http://www.networksolutions.com/whois/results.jsp?domain=untitled-game.org.

6. Constant Dullaart & Robert Sakrowski interviewed by Annet Dekker. "Capturing a cultural aesthetic: documenting net art," last modified April 26 2011, net.artdatabase.org/about/.

7. Kirschenbaum, Matthew G. 2008. *Mechanisms: new media and the forensic imagination.* Cambridge, Mass: MIT Press.

8. "Zapp TV," V2, last modified 1992, v2.nl/archive/works/zapp-tv.

9. Jason Scott says of IUMA,
> For some people, just bringing up the phrase "The Internet Underground Music Archive", or "IUMA", summons memories of all sorts of cool bands who were technically savvy enough to make their music available online for a small but growing audience. Through the IUMA main site, you'd browse hundreds, later thousands of bands, and within those bands would be thousands, later hundreds of thousands, of songs. It was huge, and it was long lived – founded in 1992, we're talking a site that brought you music through .AIFF, .MP2, RealAudio and MP3 formats because it wasn't clear which of those would be dominant.

Scott, Jason. Introduction, "Welcome Back the the Internet Underground Music Archive, an Early 90s Goldmine..." last modified May 30, 2012, www.thedailyswarm.com/headlines/welcome-back-internet-underground-music-archive-early-90s-gold-mine/.

10. Joan Heemskerk and Dirk Paesmans interviewed by the author, May 30, 2013, Dordrecht, Netherlands.

11. Ibid.

12. JODI interviewed by Tilman Baumgaertel, last modified Aug 28, 1997, www.nettime.org/Lists-Archives/nettime-l-9708/msg00112.html.

13. Ippolito, Jon. "The Art of Misuse," Telematic Connections: *The Virtual Embrace, Exhibition*, 2001, telematic.walkerart.org/overview/overview_ippolito.html.

Note: The premiere of Nam June Paik's One for Violin Solo was held on June 16, 1962, in the Düsseldorf Kammerspiel theater at the school later attended by Dirk Paesmans.

14. JODI interviewed by Akira Natsume, *Shift Magazine*, accessed June 2013, www.shift.jp.org/en/archives/1999/03/jodi.html.

15. Ibid.

16. I have seen this work ascribed to different dates by various sources, but the Fortigaurd Domain Center registry lists 1995 as the date that the www.404.jodi.org URL was purchased.

"404.jodi.org," Fortigaurd Domain Center, accessed June 2013, www.fortiguard.com/ip_rep/index.php?data=http://404.jodi.org/&lookup=Lookup?.

17. Joan Heemskerk and Dirk Paesmans interviewed by the author, May 30, 2013, Dordrecht, Netherlands.

18. Ibid.

19. "CTRL-SPACE.JODI.ORG," accessed July 2013, http://ctrl-space.c3.hu/.

20. Hunger, Francis. 2007. "Perspective Engines: An Interview with JODI." *Videogames and Art*. Ed. Andy Clarke and Grethe Mitchell. Bristol, UK: Intellect. p152.

21. Heemskerk was remarkably humble, and talked casually about picking up new coding languages as needed for JODI projects.

Joan Heemskerk and Dirk Paesmans interviewed by the author, May 30, 2013, Dordrecht, Netherlands.

22. JODI mentioned their awareness at the time of modding as a popular practice, and commented on the conventionality of these mods. They went on to say that even some artistic software modifications such as *Museum Meltdown* (1996-1999) by Palle Torsson, maintained many of the conventions established in the original games.

Ibid.

23. McMahan, Alison. "Chapter 3: Immersion, Engagement, and Presence." *The Video Game Theory Reader*. New York: Routledge, 2003. Print.

24. Pausch, Randy, Jon Snoddy, Robert Taylor, Scott Watson and Eric Haseltine. "Disney's Aladdin: First Steps Toward Storytelling in Virtual Reality." *SIGGRAPH '96 Proceedings of the 23rd annual conference on Computer graphics and interactive techniques*, 1996, ivizlab.sfu.ca/arya/Papers/ACM/SIGGRAPH-96/Storytelling in VR.pdf.

25. Connor , Michael. "Untitled Game," *EAI.org*, accessed June 2013, www.eai.org/title.htm?id=9872.

26. "[Computer game architectures] were subjected to merciless deconstruction in a manner similar to that done earlier on the Websites of Jodi's Internet projects."

From Baumgärtel, Tilman. "On a Number of Aspects of Artistic Computer Games," Media Art Net, lasted accessed June 2012, http://www.mediaartnet.org/themes/generative-tools/computer_games/scroll/#ref12.

The GLI.TC/H collective contextualizes *Untitled Game* as part of the Glitch aesthetic and practice by saying that "Jodi searched and exploited bugs within the source code of the videogame," however, I would argue that the artists were not looking for "bugs" per se, they simply exploited the medium of the game code to its fullest extent, taking advantage of all its particularities.

GLI.TC/H Collective, accessed June 2013, gli.tc/h/gallery.html.

27. For example:

Hunger, Francis. 2007. "Perspective Engines: An Interview with JODI." *Videogames and Art*. Ed. Andy Clarke and Grethe Mitchell. Bristol, UK: Intellect.

Galloway, Alexander R. 2006. *Gaming: Essays on Algorithmic Culture*. Minneapolis: University of Minnesota Press.

28. School of the Art Institute of Chicago, "Conversations at the Edge," last modified 2006, vimeo.com/10646976.

29. Of note here in regards to the earlier discussion on access to JODI works, is the fact that the website jestsetwilly.jodi.org for *Jet Set Willy Variations ©1984* (also a game modification like *Untitled Game*) contains a direct link to a list of downloads for various emulators needed to create a playable environment for the work: www.worldofspectrum.org/emulators.html. The artists are explicitly engaged here in archival strategies and documentation. They also provide a link on this site to images of *Jet Set Willy* ephemera, a ZX Spectrum keyboard, and a short list of key commands for the original game (http://jetsetwilly.jodi.org/use.html).

Additional note: I was unable to verify *Spectrum*'s date of creation.

30. Schleiner, Anne-Marie. "Untitled Game CD by JODI Review." Last modified 2001. www.opensorcery.net/2reviews.html.

31. JODI. "sound (self, CHAN_VOICE, "soldier/idle.wav", 1, ATTN_IDLE);walkmonster_start ();" *Nettime archive*, last modified October 22, 2001, http://www.nettime.org/Lists-Archives/nettime-bold-0110/msg00556.html.

32. Baumgärtel, Tilman, Joan Heemskerk, and Dirk Paesmans. 2002. *Install.exe - Jodi*, [plug in] Kunst und neue Medien, Basel, 18. September bis 27. Oktober 2002. BüroFriedrich, Berlin, 31. Januar bis 16. März 2003. Basel: Merian.

33. An archived description of "Game Sprockets" software on the Apple website: support.apple.com/kb/dl1237?viewlocale=en_us.

Brief description of "MAC IPX" software, which allows Macintosh computers to connect to other networking software.

"Macintosh MacIPX Info," *James Madison University: Computing*, accessed June 2013, www.jmu.edu/computing/mac/macipx.shtml.

Incidentally, the sound output driver does not function well with the use of a modern day emulator, as documented on the Emaculation website (a fantastic emulation resource). I experienced the same "echoing" sounds as described here:

> *Sheepshaver w/ New World ROM - It has a somewhat playable frame rate and runs very well with a fast processor. Sound, on the other hand, lags, echoes, and in general, it's TERRIBLE! If this occurs, I heavily recommend you turn the sound off.*

"MECS: The Mac Emulation Compatibility Sheet," Emaculation.com, accessed June 2013, www.emaculation.com/doku.php/compatibility_sheet.

34. "Engines," *The Quake Wiki*, accessed June 2013, http://quakewiki.org/wiki/Engines.

35. "Config Files," *The Quake Wiki*, accessed June 2013, http://quakewiki.org/wiki/Config_files

36. "The Console Commands List," University of Delaware, Electrical and Computer Engineering and Computer and Information Sciences Department, accessed July 2013, www.eecis.udel.edu/~portnoi/quake/quakecom.html - v_kickroll.

37. "Cheats and Console Commands," *The Quake Wiki*, accessed July 2013, quake.wikia.com/wiki/Cheats_and_Console_Commands.

38. A separate console command allows Arena participants to enter their desired screen name, and change it from the default "--".

39. Joan Heemskerk and Dirk Paesmans interviewed by the author, May 30, 2013, Dordrecht, Netherlands.

40. Schleiner, Anne-Marie. "*Untitled Game* CD by JODI Review." 2001. www.opensorcery.net/2reviews.html.

41. Connor , Michael. "Untitled Game," *EAI.org*, accessed June 2013, http://www.eai.org/title.htm?id=9872.

42. Blinn, Jim. 1998. *Jim Blinn's corner: Dirty Pixels*. San Francisco: Morgan Kaufmann Publishers.

43. van Dam, Andries. "Introduction to Computer Graphics," last modified October 30, 2007. static.docstoccdn.com/docs/152446953/Realism-in-Computer-Graphics.

44. Joan Heemskerk and Dirk Paesmans interviewed by the author, May 30, 2013, Dordrecht, Netherlands.

45. "Scanline Rendering," *Princeton.edu*, accessed July 2013, www.princeton.edu/~achaney/tmve/wiki100k/docs/Scanline_rendering.html

46. Boyer, Kim L., and Sudeep Sarkar. 2000. *Perceptual Organization for Artificial Vision Systems*. Boston, Mass: Kluwer Academic.

47. Gitelman, Lisa. 2006. *Always Already New: Media, History and the Data of Culture*. Cambridge, Mass: MIT Press.

48. Ibid.

49. The concept of "affordances" discussed at length in: Norman, Donald A. 1998. *The Design of Everyday Things*. London: MIT.

50. Ippolito, Jon. "The Art of Misuse." *Telematic Connections: The Virtual Embrace*, last updated 2001, telematic.walkerart.org/overview/overview_ippolito.html.

51. The exhibition *Documenta X* in Kassel, Germany (1997) codified many artists around this point. Internet-based works were ghettoized in an office-like environment away from the main areas of display. Works were hosted online through the main Documenta website (see an archived version here www.documenta12.de/archiv/dx/), however, the Internet connection was limited and, as JODI says, caused site crashes when any links were clicked within their jodi.org site.

See JODI's remarks here:
JODI interviewed by Tilman Baumgaertel, *Nettime archives*, last modified August 28, 1997, www.nettime.org/Lists-Archives/nettime-l-9708/msg00112.html.

General description of Documenta X here:
Baumgartel, Tilman, Kathy Rae Huffman and Margarete Jahrmann. "The Opening of Documenta X, A First Flash Report: Net Art without Links," last modified June 27, 1997, www.heise.de/tp/artikel/4/4073/1.html.

52. ▯Pau David Alsina Gonzalez, "Software Art and Political Implications in Algorithms," in *R▯e▯a▯d▯ _m▯e▯: ▯S▯o▯f▯t▯w▯a▯r▯e ▯A▯r▯t ▯&▯ ▯C▯u▯l▯t▯u▯r▯e▯s*, 2004, ▯O▯l▯g▯a▯ ▯G▯o▯r▯i▯u▯n▯o▯v▯a▯ ▯a▯n▯d ▯A▯l▯e▯x▯e▯i ▯S▯h▯u▯l▯g▯i▯n (Denmark: University of Aarhus, 2004).

53. In *Mechanisms*, Matthew Kirschenbaum calls this "formal materiality" and describes it as "…the imposition of multiple relational computational states on a data set or digital object. Phenomenologically, the relationship between these states tends to manifest itself in terms of layers or other relative measures, though in fact each state is arbitrary and self-consistent/self-contained."

Kirschenbaum, Matthew G. 2008. *Mechanisms: New Media and the Forensic Imagination.* Cambridge, Mass: MIT Press.

54. Robert Sakrowski, "Net Art in a White Cube—A Fish out of Water" in *Net Pioneers 1.0: Contextualizing Early Net-Based Art*, 2009, ed. Dieter Daniels and Gunther Reisinger (Berlin: Sternberg Press, 2009).

55. I'm discussing change here as a negative force according to the conservation mindset, although the "aesthetics of decay" have been widely embraced by net.art and according to some, a wider counter-culture.

See:
Menkman, Rosa. "The Glitch Manifesto," accessed June 2013, networkcultures.org/_uploads/NN#4_RosaMenkman.pdf.

56. Radin-Fino, Ben, "Digital Preservation Practices and the Rhizome ArtBase," last modified 2011, media.rhizome.org/artbase/documents/Digital-Preservation-Practices-and-the-Rhizome-ArtBase.pdf.

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