



Marcel Duchamp with *Rotary Glass Plates Machine (in Motion)*.  
Photograph by Man Ray, 1920 (Courtesy Timothy Baum)

# SCREEN, SAVER

by David Reinfurt

Three minutes of doing nothing, then everything goes black. In 1983, John Socha wrote the first screensaver software to preserve the image quality of computer displays. Published in *Softtalk* magazine in 1983 and named SCRNSAVE, the simple program turned the user's screen to black after three minutes of inactivity (the time could be adjusted only by recompiling the program.) Personal computers were becoming affordable and popular, but their high-contrast green phosphor cathode-ray screens were subject to burn-in, where light intensity in one part of the screen left behind a permanent mark. SCRNSAVE was designed to eliminate these ghost-images and preserve the computer's screen, coining the term and introducing a new software genre along the way.

An abbreviated, asynchronous and admittedly free-associative pre-history of the screensaver might reasonably begin with Marcel Duchamp. Beginning in 1918, Duchamp pursued his Precision Optics project through a series of machines, films and assemblages. *Rotating Glass Plates (Precision Optics)*, 1920, was comprised of four Plexiglas wings with black painted stripes placed along a rotating shaft. While the machine was engaged, the Plexiglas fins worked together to create a fleeting image of concentric rotating circles. *Disks Bearing Spirals*, 1923, *Rotative Demisphere (Precision Optics)*, 1924, and *Disks Inscribed with Puns*, 1925–26, developed this interest in creating involved structures to create complex effects, automatically. He combined a simple graphic motif (the concentric spirals of *Disks Bearing Spirals*) with an elaborate machine, and produced moving images that never appeared to be the same twice.

By 1926, with the film *Anémic Cinéma*, Duchamp employed the Rotative Demisphere machine and alternating spiral and pun disks to maximum effect. The film shifts seamlessly between abstract graphics and language, suggesting an infinitely rearrangeable composition (like its anagrammatic title.) As the proto-screensaver, it is a simple graphic, an elaborate mechanism and the resulting image—constantly shifting into and out of phase

and sequence. Even the themes—an animated (nonsense) message and an abstract geometry—prefigure the first screensavers. Do you remember Your Message Here, with its custom message floating aimlessly across the screen, or Mystify, with its bouncing and repeating trapezoids, from Microsoft Windows 1.0? By 1935, Duchamp attempted to commercialize this simple idea and introduced his Rotoreliefs at the annual inventors' fair in Paris. Designed to be played on an ordinary record player, these abstract concentric graphic disks became animated compositions when spun on an ordinary record player. His attempts to sell these to a general public proved hopeless.

Between 1922 and 1930, László Moholy-Nagy worked sporadically with the assistance of a technician and an engineer to realize his *Light Prop for an Electric Stage* (also known as the *Light-Space Modulator*.) The approximately 120 cm x 120 cm construction was made of chrome-plated steel, aluminum, glass, and Plexiglas perforated discs, armatures and planes mounted on a rotatating turntable and a wood base. Moholy-Nagy described it as a lighting mechanism for demonstrating “both plays of light and manifestations of movement.” When put into motion and placed in the middle of a room (as originally conceived for the Provinzialmuseum, Hanover), the parts each move individually in a constantly changing arrangement. Stationary light sources are directed at the assembly illuminating a continuously moving mechanism and producing shadows, reflections and transmissions in an always-changing light play. (Like Duchamp, Moholy-Nagy also used this machine to produce films including *Lichtspiel*, *Schwarz-Weiss-Grau*, 1932.) Describing its purpose, László said simply, “This piece of lighting equipment can be used to arrive at countless optical conclusions.”

The next stop in a pre-history of the screensaver is the tiny green phosphor screen of the cathode ray oscilloscope. The oscilloscope is a piece of electronic test equipment that allows signal voltages to be viewed as a two-dimensional graph of potential differences, plotted as a function of time. When testing an electronic system, the phase differences between two signals form two sinuous curves on the screen of the 'scope, connected together, constantly drawing and redrawing themselves as a horizontal figure eight. These familiar shapes are known as Lissajous curves (after Jules Antoine Lissajous, 1822–1880) and result from viewing a two-variable parametric equation calculate

and recalculate itself over time. Two signals of varying frequency and phase result in a perpetual infinity (figuratively and literally as it actually constructs itself in the shape of the infinity sign ( $\infty$ )), drawing and redrawing itself over and over, a picture of timing and sequence in the center of the oscilloscope's green phosphor screen. (Watch out for those ghost-images!)

The Lissajous figure returns in the title sequence of Alfred Hitchcock's *Vertigo*, 1958. Perhaps you recall the simple line graphics spiraling out from the human eye in the first minutes of the film? These special-effect film graphics are the work of John and James Whitney. Familiar with their previous work in producing short abstract graphic films, title designer Saul Bass asked the Whitney brothers to contribute a visual sequence to the opening titles.

James Whitney had studied engineering in his native California while John Whitney left for France to study music. John began making short abstract films that he saw as analogues to his music while living in Paris in 1938. (Did he see Duchamp's *Rotoreliefs*?) He expanded the idea on returning to Los Angeles and made *Five Film Exercises*, 1943–44, together with James. This film was produced using an optical film printer of their own design based on the rotating mechanism from a salvaged U.S. Army M-5 anti-aircraft controller and multiple cards with apertures of varying size and alignment. The Whitney brothers would continue to develop the small-house-sized machine for forty years in the back yard of their Los Angeles workshop.

John, heavily engaged with the latest technologies, and James, increasingly engrossed in the study of Eastern religion, fused a sensibility which remains today in contemporary screensavers. With *Yantra* (“machine” in Sanskrit), 1950–57, the Whitney brothers used a stack of punched cards to create optical effects (much as a computer of that time would use punchcards to load its program.) Layering these and projecting light through each while moving, they were able to produce compelling moving images of systems and interference. John continued to push with increasingly technical methods for creating his abstract images. By 1968, with *Permutations*, he was already employing the latest computer graphics systems and advanced military motion tracking facilities to make his not-yet-screensavers. Other filmmakers built directly on what the Whitneys had started. Notably, in Stanley Kubrick's *2001: A Space Odyssey*, 1968,

Douglas Trumbull created an abstract fantasy of timing and light to a soundtrack by Gyorgi Ligeti. The resulting scene, produced with an analog machine very similar to the Whitneys', was titled *Beyond the Infinite* and looks remarkably like the current Macintosh OS X default screensaver, *Flurry*.

Meanwhile in 1968, a Physicist from Ann Arbor, Michigan invented a system for drawing complex and constantly reconfiguring pictures of phase and sequence. Lloyd G. Cross invented Sonovision, a simple laser light show which could be used to project a “visual display of sound” (U.S. Patent No. 779,510,27). His device consisted of a loudspeaker with a reflective membrane and a helium-neon laser pointed at the reflective surface to produce patterns on a wall or screen in time to the music fed to the loudspeaker. A self-contained 2-megawatt version in a futuristic-looking molded case was offered for \$1,095. The Sonovision's operation is described best by an early fan:

When one simple sound or musical note is introduced, the dot moves in an ellipse at the frequency of the sound supplied. When the note is changed, a different ellipse with a new orientation is formed. When two notes are introduced simultaneously, the laser beam produces a combination of the two ellipses, similar to the Lissajous patterns obtained from cathode-ray tubes. Thus a symphony of notes will result in a symphony of ellipse interference patterns on the display screen.

Laser light shows were almost immediately combined with live musical performance, first in a production of “Faust” in Finland, famously by Pink Floyd and infamously by Blue Oyster Cult, who in 1976, recklessly pointed the lasers back at the audience causing minor injuries and considerable concern. Well-known light show technicians included Mark Boyle and Joan Hills (London), The Joshua Light Show (New York) and Single Bird Turquoise Wing (Los Angeles). Each began with a simple graphic and a complex system to produce constant rearrangements. Boyle and Hillis used corrosive chemicals on an overhead display, The Joshua Light Show combined moving lights and simple shapes, while Single Bird Turquoise Wing used multiple media. These psychedelic light shows tried to create a visual composition which, although recognizable in its parts, never performed itself the same way twice, mimicking and presupposing the fundamental logic of the digital computer and screensaver software.



In the early 1960s, Brion Gysin created a machine to produce similarly psychedelic syntheses of constantly evolving light patterns. While living with William Burroughs at the Beat hotel on Git-le-Cœur, Paris, and with the aid of Cambridge mathematician Ian Somerville, Gysin designed a simple paper cylinder with periodic apertures surrounding a bare light bulb placed on a rotating turntable at 78 rpm. The resulting flickering light repeats at a constant frequency between 8 and 13 Hz matching the brain's alpha waves present in deep relaxation, such as drifting into sleep. When a viewer closes their eyes, sits close to the machine and the turntable is started, the flickering light induces waves of color and repeating geometric patterns that form and reform in the mind's eye. Ian Somerville described the experience in a letter to Gysin:

Visions start with a kaleidoscope of colors on a plane in front of the eyes and gradually become more complex and beautiful, breaking like surf on a shore until whole patterns of color are bounding to get in. After awhile the visions were permanently behind my eyelids and I was in the middle of the whole scene with limitless patterns being generated around me.

Unlike a pharmacological trip, the experience ends when the user opens their eyelids. Gysin called his vision machine for closed eyes the Dreamachine.

Early television and video art are also worth reviewing in this context. Stan VanDerBeek, after studying film and graphics at Cooper Union and at Black Mountain College, began early investigations into using computer software to create video and television works. In *Image After Image*, created while a fellow at the MIT Center for Advanced Visual Studies, VanDerBeek worked together with computer programmer Ken Knowlton to create "mental movies"—abstract processions of graphics and programmatic imperatives that could only be realized in real-time. In 1965, Nam June Paik made *Magnet TV*, attaching a heavy grade magnet to a normal television set to constantly and unpredictably alter the cathode rays and produce abstract, changing patterns. Later, Steina and Woody Vasulka created *Noisefields*, 1974, consisting of a circle keyed on a background of electronic snow. The circle appears and disappears, articulating the full range of possible colors and patterns of interference with the artifacts of

reproduction. It seems more than a coincidence that the primary journal collecting this emerging televisual work was called *Radical Software*.

No stranger to light shows, software, or oscilloscopes, Brian Eno has produced a body of work which privileges the ambient spaces, times and sounds between events, when nothing happens. As a musician, producer, and artist, he has made this marginal space spectacularly productive. In the liner notes for *Ambient 1: Music for Airports*, Eno lays out his strategy for an ambient music. He recounts being laid up in bed with a broken leg at his home when a visitor put a new record on the stereo for him to enjoy. She left with the volume of the stereo much too low, causing the music to merge with all of the other sounds in the room. Stranded in bed and unable to adjust the volume, Eno realized that the effect was beautiful and that music could be made as a serious background—a carefully considered ambience meant to be largely ignored.

Ten years later, in an interview with *PC Magazine*, Brian Eno picked up the thread. To his interviewers' dismay, he claimed that the only useful quality of computers is their potential as semi-automated compositional systems. He confronted the interviewer, stating that "the only interesting thing about computers is screensaver software." Software used to move large chunks of data around (such as video editing, page layout or even word processing) were useless—the transformative power of software was its ability to create real-time models that automatically generate endless variations—a soft assembly always becoming something else, a simple graphic and a complex algorithm.

As computer display technology rapidly improved, lower contrast displays and graphical interfaces appeared (such as Apple Macintosh, 1984), screensaver programs became increasingly redundant. No longer required to preserve the image quality of the screen, they were re-employed for entertainment and marketing, leading to increasingly frivolous softwares such as those released by After Dark for the Macintosh. The screensaver function was not built into the operating system, so After Dark provided a third party software with modules for different effects, including Starry Night, Stained Glass and, of course, Flying Toasters—animated retro-styled toasters with wings moving across the deep black background of the screen in lock-step to Wagner.

A more recent screensaver actually does something. SETI@Home is a distributed

computing project from University of California Berkeley which operates as a screensaver. SETI (Search for Extra Terrestrial Life) uses spare processing time on a group of inter-networked computers, each running the screensaver software, to process radio telescope signals from the Arecibo observatory in Puerto Rico. Distributed or Grid Computing harnesses the extra power of a large group of computers to solve processing-intensive problems by parsing out the job among a group of dispersed machines networked together to act as one. In this case, the Arecibo radio telescope is constantly sending and receiving signals into deep space in an unending search for extra-terrestrial life and the radio data is recorded on magnetic computer tape and flown by U.S. Mail to Berkeley. In Berkeley, the massive processing task of parsing the radio signals to identify possible patterns is broken up into pieces and the jobs are sent out to participating computers, each with SETI@Home screensaver installed. When a particular computer is not being used, the screensaver is engaged and the Search for Extra-Terrestrial Life resumes.

Grid Computing, however, is not isolated to the Search for Extra Terrestrial Life. World Community Grid is currently using spare processing cycles on idle computers to study protein folding and AIDS diagnosis patterns. Perhaps this distributed logic is somehow germane to the screensaver form—it may or may not be surprising that the two programmers credited with the Flying Toasters screensaver went on to form Moveon.org, the distributed political action facility.

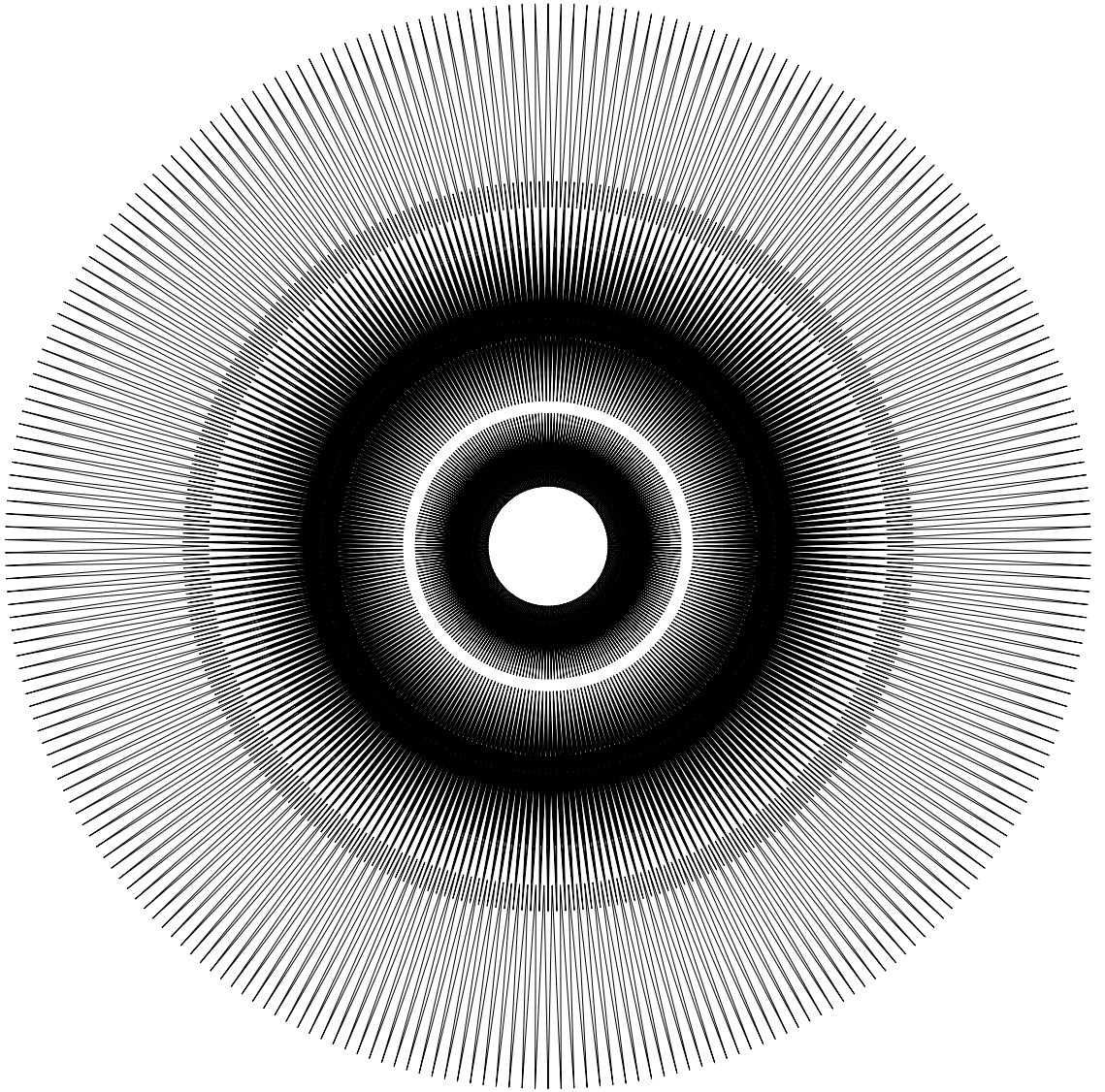
A recent Op-ed piece from the *New York Times* eulogized the political death of what had been derisively called "Al Gore's Screensaver." Since his Vice-Presidency, Gore advocated The Trius project—a satellite to be put into orbit around the Earth on a geosynchronous path (at position Lagrange 1) which would send back live images of the whole Earth and the full Sun. This project was intended to feed a series of real-time displays, installed as screensavers on computers in public schools. Al Gore woke up one morning wondering if it would be possible to beam a continuous image of the full Earth back from space to inspire people with the need to care for our planet much as the 1972 Apollo 17 portrait of the whole Earth had crystallized the Ecology movement and shifted public consciousness. Development began in 1998 at a cost of only \$100 million (1/1000th the cost of the International Space Station.) This live

image, while showing nothing specific at any one moment, over time might both educate and garner support for alternative policies to reverse the course of global warming. Opponents in the Bush administration and in Congress finally were able to kill the project and belittle the idea—it was only a fancy screensaver, doing nothing.

Compare Al Gore's Screensaver to the recent "killer application" Google Earth and fundamental software ideologies become clear. Google Earth is a shockingly comprehensive global mapping program which synthesizes satellite images, maps and user commentary into one complete soft model of the earth. Synthetically floating before you in the black deep space of the computer screen, the Google Earth (as opposed to Al Gore's rather more tedious actual Earth) promises transportation to any place in the world, virtually, instantly. A user types in Dayton, Zagreb or Seoul and is immediately propelled in a computer animated and admittedly exhilarating flight towards the selected destination. On arrival, the user may further zoom, turn off the roads, add comments, find the closest 7-11. This software is an instrument, meant to be used, written to bring you the whole world at your disposal inside the soft silicon comfort of your home computer (Where do you want to go today?<sup>TM</sup>)

Given the most commonly used criteria of *utility* for software, it's not surprising that the screensaver is a debased form. It does nothing, it says nothing and it takes you nowhere. Instead, it provides a quiet, even ambient portrait of the system—a simple image, a complex algorithm and an ever-changing picture of their interaction. Still, as Al Gore's Screensaver may suggest, there may be something to doing nothing. The computer, Alan Turing's universal machine tirelessly capable of emulating the behavior of any other tool, is finally given a rest. After three minutes of doing nothing, the screensaver kicks in and the software produces the silently reconfiguring image of a system falling into and out of phase, automatically generating a fleeting picture of interference and coordination on your computer screen. Perhaps, there is something left to save.

Overleaf: For HYPNOTIC SHOW (Jessica Silverman Gallery, San Francisco, April 2008, curated by Raimundas Malasauskas), artist Gareth Spor has upgraded the Dreamachine by imprinting a text into its slits—"illusion is a revolutionary weapon," from William S. Burroughs' essay "The Electronic Revolution."



SCREEN is a simple screensaver program designed and programmed by O-R-G.  
Available at <http://www.o-r-g.com/view.html?project=115>