The Red Truck

When I first became involved in art in the mid-70s, the easiest platform to participate in allowing for connections to others around the world was mail art, sometimes called correspondence art. The idea, initially developed by Ray Johnson, was any art that could be sent through the postal system to someone else transcended correspondence and could be displayed as art.

The first response I received to my contribution to a mail art show came from an artist in Switzerland. As nearly as I can recall, he wrote:

"I love your name. Fred Truck, Red Truck. Ha, ha. Get it?"

This brief note became the basis of the *Red Truck*, a self-portrait in the form of a 1929 Ford Closed Cab Pickup Truck. This particular model of pickup truck, characterized by its very tall boxy look, was also known as the *Rolling Telephone Booth*, which enabled me to think of this machine as a telecommunications computer.

Machines

Classic machines are made up of an array of six elemental machines: lever, screw, inclined plane, wheel, pulley, and gears. All other machines can be constructed from these basic parts. When the constructed machine is no longer needed, it is taken apart and its parts returned to bins so that new machines can be constructed from the same parts. Thus, the parts of machines are more important than the constructed whole of a given machine. A good analogy for this practice would be metonymy—the poetic substitution of the part for the whole.

Artists have used machines in the past as the subject of their work. Aaron, an AI software written by Harold Cohen was the first work of software art that made images on its own. To Cohen's credit, this was

a major breakthrough that no one has followed up on, possibly because to do so requires the artist to know how to program. Now there are AI neural nets that are making images on the net. The artist describes an image and it is executed by an AI neural network. These networks rely on massive amounts of information from all over the web to make images. Some results are good, many not so good.

Self Portrait

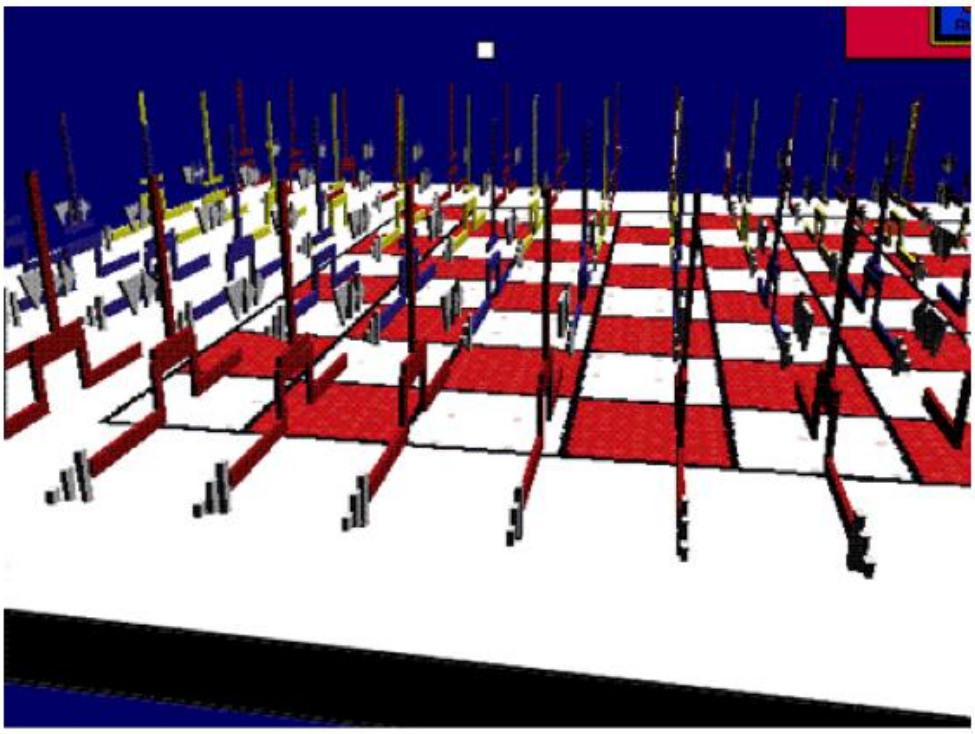
My approach differs from those I've listed here. I am advocating for a different kind of self-portrait. Traditional self-portraits linger over the appearance of the artist. A more revealing portrait would show the behavior of the subject. Sometimes, in the hands of a masterful artist, character is revealed through facial expression or attitude, but I'm not referring to insight. I'm referring to the action of the subject.

What kind of material would reveal the action of the artist, and thereby make him or her an open book?

The answer is an analog computer built by an artist. The subject of the self-portrait.

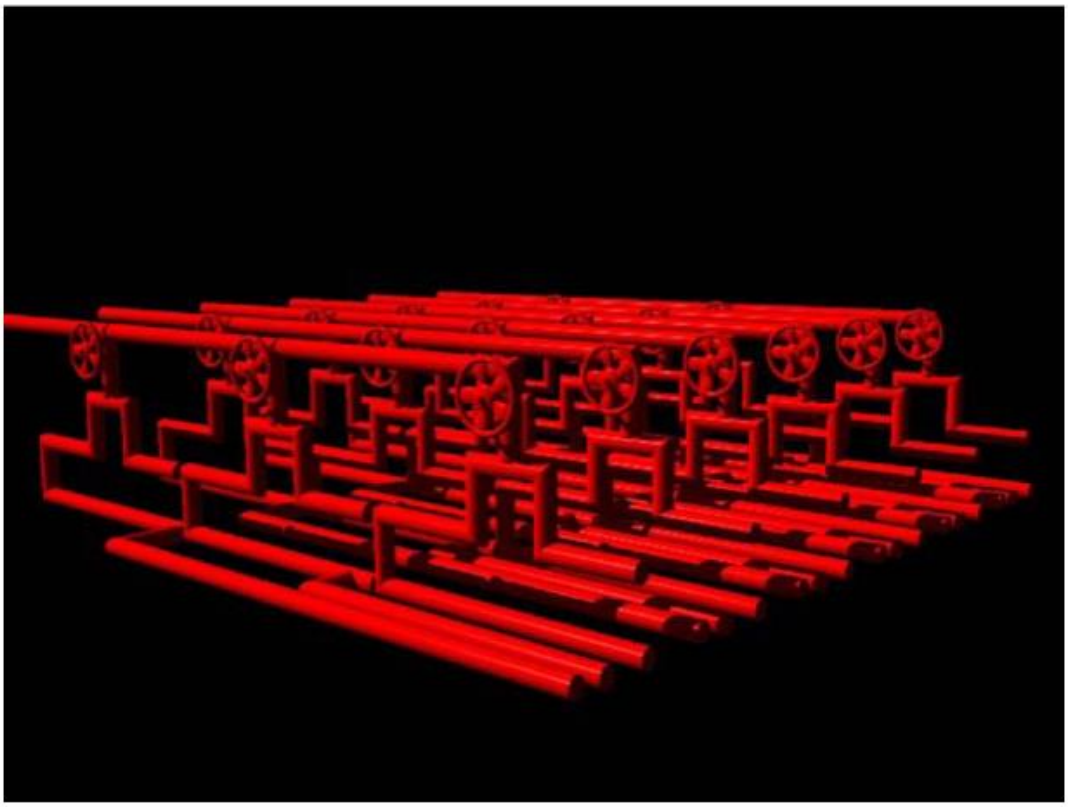
An artist's computer is one built by an artist for the sole purpose of artistic production. Taking machine practice (of the classic machine elements being more important than a larger machine constructed from them) and use of metonymy as my cue, here are two parts of my artist's computer—The *Memory Device* and *Analog Engine*.

The *Memory Device*



This image shows the *Memory Device* in its very early stages of development. It consists of 72 switches. Another design stage followed:

Red Truck by Fred Truck



In this stage, the *Memory Device* consisted of 18 switches. Here, for the first time, hand wheels to set the switches appear, and input and output are differentiated. Six inputs (coming from the rear of the device) result in 18 different outputs.

Why not 24 or 108 switches? Or less?

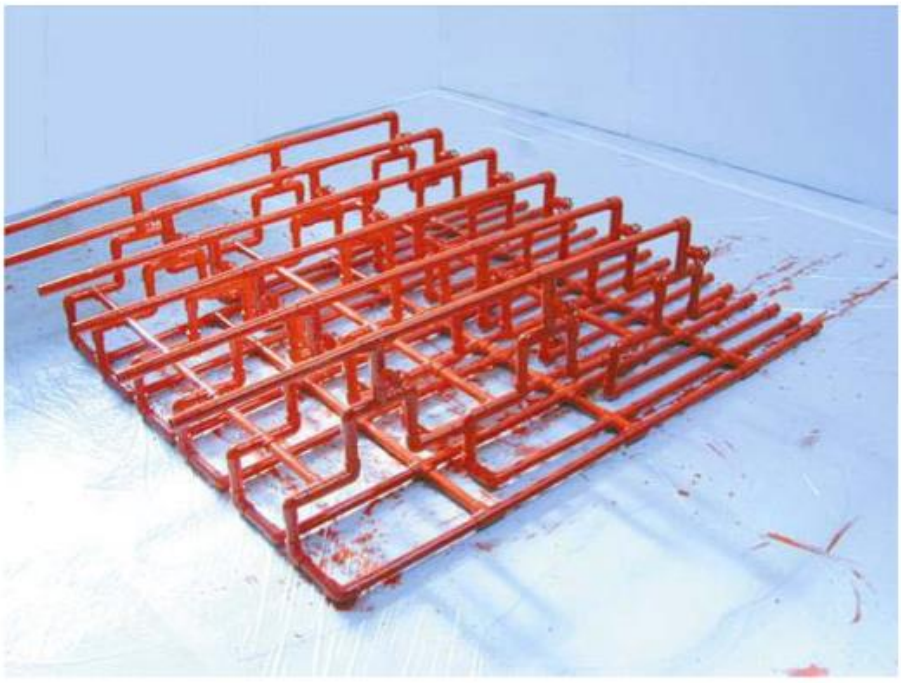
When I was in high school and just beginning to wrestle with art issues, a perceptive teacher told me to pay attention to my dreams. I did this. By the time I was at the end of my college career, I found that I did not have repeating dreams, but I did have many repeating images.

1. Caduceus (messenger)
2. Snake
3. Field
4. Ecstasy
5. House

6. Wise woman
7. Mother
8. Death
9. Child
10. Warrior
11. Pitcher
12. Shallow valley
13. Umbrella
14. Plague
15. Flesh
16. The Word
17. Water
18. Tree

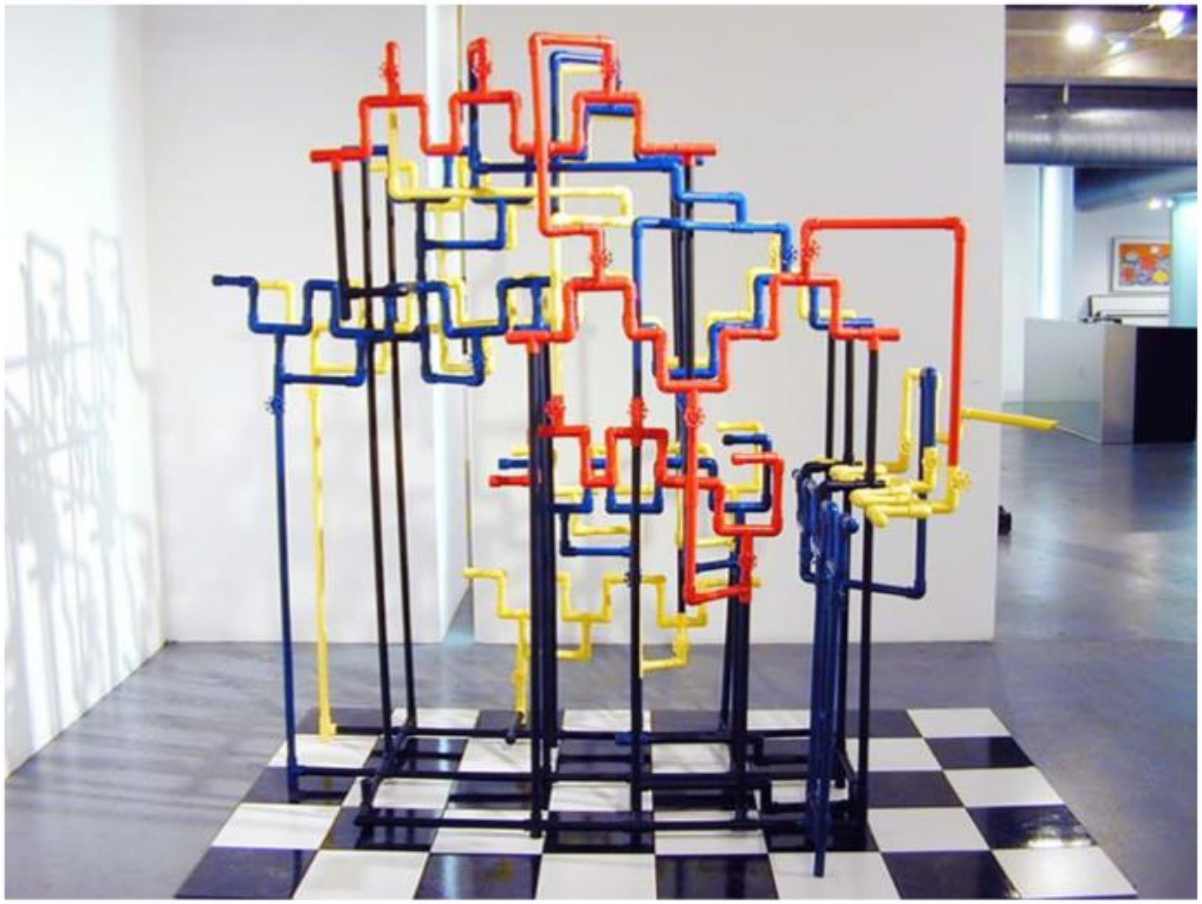
Over the next few years, I tracked those images. In 1974, I finally formalized these images in a language of 18 images, based on all shown here. This language has changed somewhat over the years, but its essence has remained the same. One other element, a feature of all my most intense dreams, was an extremely clear sense of perspectival space; that is, my most powerful dreams all seem to be enacted in a rationalized space.

Red Truck by Fred Truck



This is the final form of the *Memory Device*. My sculpture is approximately 6 feet square and 18 inches high. It is made of PVC and painted in gloss latex. It differs primarily from the preceding design in the manner in which the outputs are routed.

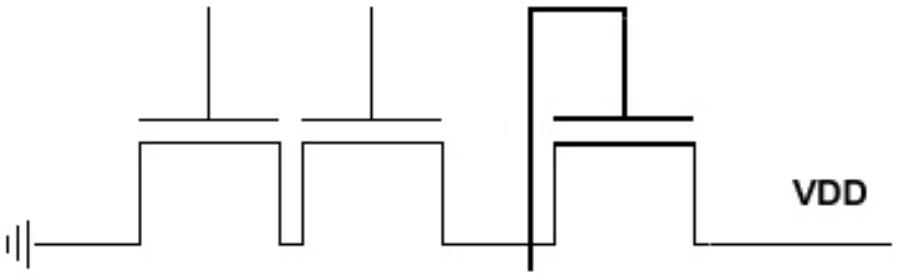
Analog Engine



In 1986, I began *ArtEngine*, a piece of software for the Macintosh computer. The user submitted two previously edited images to the *Engine* and from them, it generated a new, third image. I wrote this software, which incorporated some artificial intelligence techniques, in MacScheme, a compact rendering of the Scheme dialect of LISP, the staple language of artificial intelligence programming.

In 1991, the Macintosh no longer supported some of the conventions and techniques Macscheme used, and *ArtEngine* found itself without a platform. I was reluctant to walk away from five years of work with an idea I found intriguing. As I thought over possible directions to go in, I remembered an interesting fact about LISP. LISP is

rich in symbolic logic functions. A symbolic logic function, or BOOLEAN function is any of these logical functions: AND, OR, NAND (Not AND), NOR (Not OR). Because it encourages the programmer to define new functions by combinations of the given ones, LISP is particularly useful for simulating logic chips, before they are committed to silicon. I also learned that all the logical functions can be generated by various combinations of the NAND gate.At the same time I remembered this, I ran across a diagram for a NAND gate, which is very similar to the on/off switch shown above:



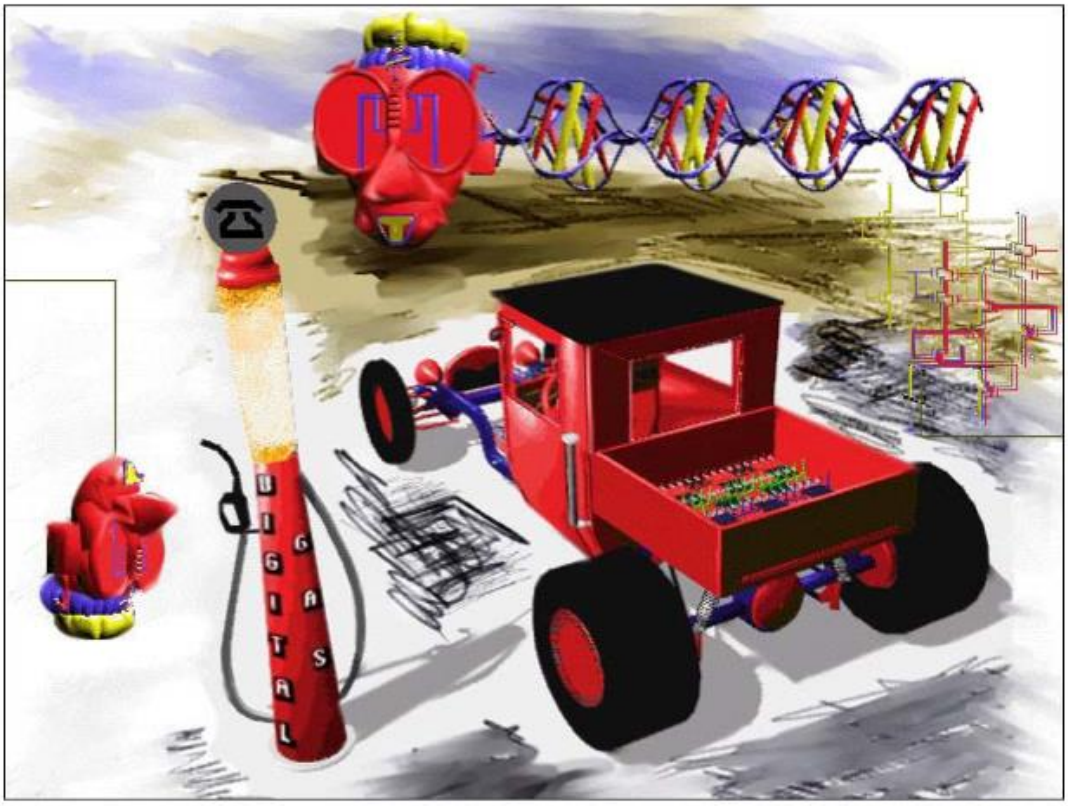
The NAND gate is made up of 3 transistors, two input transistors and one output transistor. In the diagram above, the heavier line is the output transistor. I was excited with by the wave-like appearance of the NAND gate. I wondered what the central routine of *ArtEngine* would look like if I visualized its logic.

The central logic routine of *ArtEngine* determines that two things have been put to it, and that one input is symbolically true and one is symbolically false. That is, the two inputs are different. After difference is determined, the *Engine* approves the generation of a synthetic third image from them using other software or hardware following the *Engine* module in the information flow.

Digital Gas and Mobile Computing

The first computer I bought was an Osborne I portable microcomputer. It had a tiny 5.5" diagonal screen, two disk drives, 64K of RAM and weighed about 35 pounds, thus making it marginally portable. Compared to the laptops or palm computers of today (2002), it was absurdly clunky but it keyed on a basic need most Americans have: the need to get up and go and to take whatever they want with them.

This perception led to a series of prints called *Digital Gas*. The first print has the same name as the series.



The Memory Device

The Memory Device is in the bed of the rod, which is powered by *Analog Engine*, though in this image, that fact is not visible. Next to the *Red Truck* is an antique gas pump. Though the pump is labeled as *Digital Gas*, at the top is a telephone symbol, where an oil company logo usually appears. The *Red Truck* is fueled here, not by steam as *Analog Engine* is, or gasoline as a car would be, but by telecommunications. Information.

The Mayan Sun God is a frame for the image. The Sun God is derived from classic Mayan sun god imagery, with some differences. Where the classic god has a sky band body, my Sun God's body is made up of a double helix of DNA, with *Analog Engine* making up another segment. The Sun God is information of another sort. It is information that takes two different things and makes a new third thing out of them.

Drive is a straightforward depiction of information on the move.

American Home

The last image in the *Digital Gas* series is called *American Home*. Featuring the *Red Truck*, the Mayan Sun God and the *Digital Gas* pump from the series title image, it also shows my house at that time.

Many people do most, if not all, of their work with computers at home.

While pursuing these visualizations of *Analog Engine* and mobile computing, I was busy engaged with other projects. One of these took me to one of the hardware superstores in my area. I needed some PVC plumbing parts. I took one look at the amazing array of parts available to me at a very reasonable price and realized that by making some small

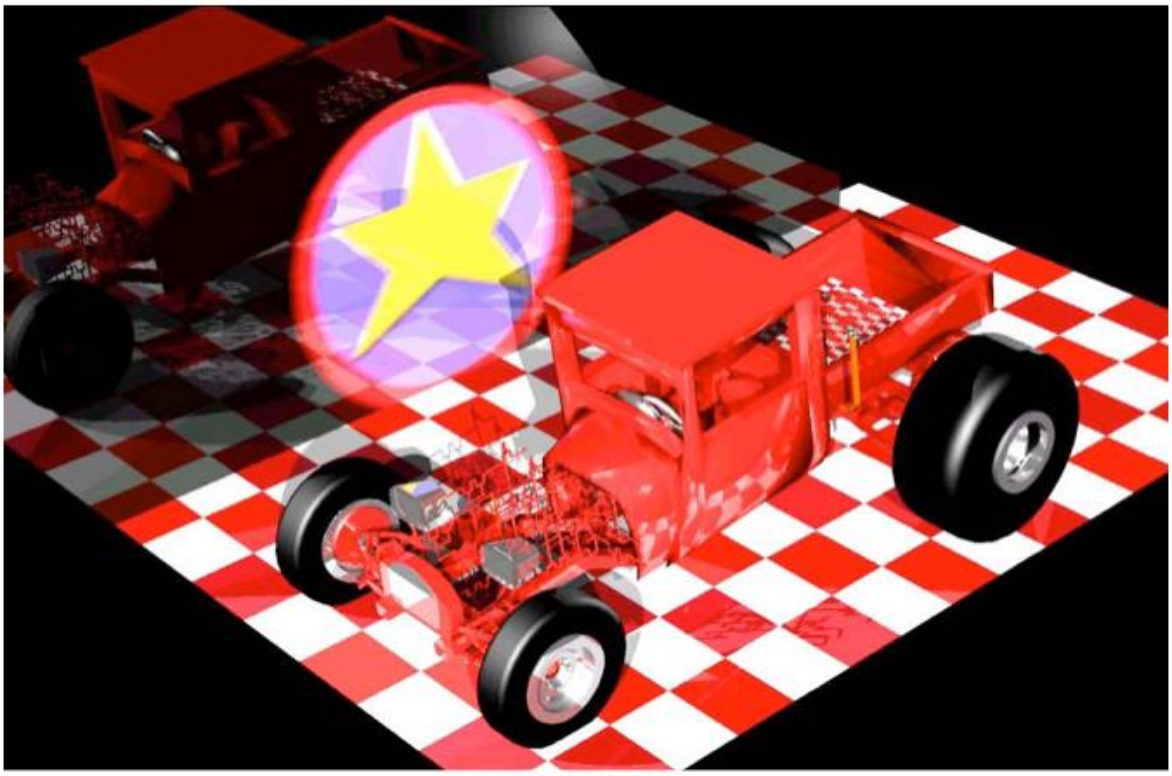
changes in the Engine's design, it might be possible to build a sculpture out of PVC. In particular, a PVC Stop and Waste valve was very interesting to me.

CAD/CAM and Rollout

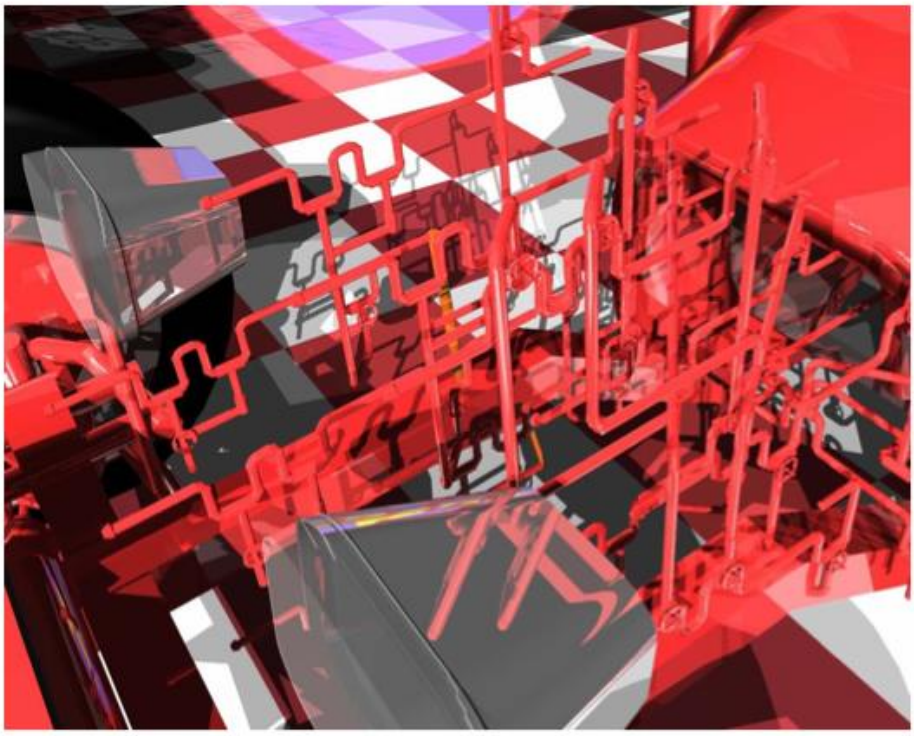
In March of 2000, I got a new computer with new CAD/CAM software. This prompted me, over the next 9 months, to do a new version of the *Red Truck*, as well as a new version of the Engine.

While the *Red Truck* remained substantially the same, *Analog Engine* now featured hand wheels and valves rather than pistons. Part of the reason I did this was that very early computers did not have transistors, but assemblies of vacuum tubes. Switches were called valves and were set by hand. The other reason I used hand wheels of course was I had begun to think seriously about using PVC for a sculpture and I wanted to see how stop and waste valves would look.

Red Truck by Fred Truck



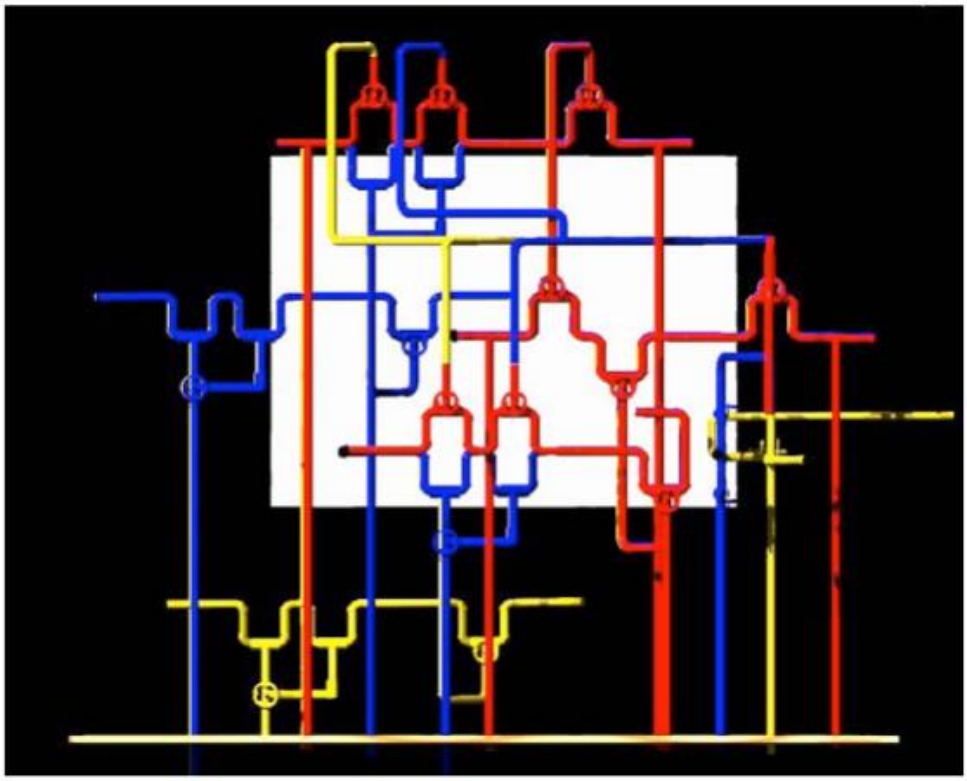
This print is called Rollout. The Badge of Quality, a fictional corporation that is a frequent subject of my work, is rolling out the first production version of their retro hot rod, the *Red Truck*. A checkerboard floor, both on the ground and in the bed of the truck, is prominently featured. *Analog Engine* drives the truck, and the *Memory Device* is in the bed.



This image is called *Engine Abstraction*, and is a close up view of *Analog Engine* in the *Red Truck*. The hand wheels can be seen more clearly, and also, in the right center area one can see diagonal connections allowing the output of one layer to feed the next layer. This version of Engine is monochrome, in keeping with the monochrome styling of the hot rod.

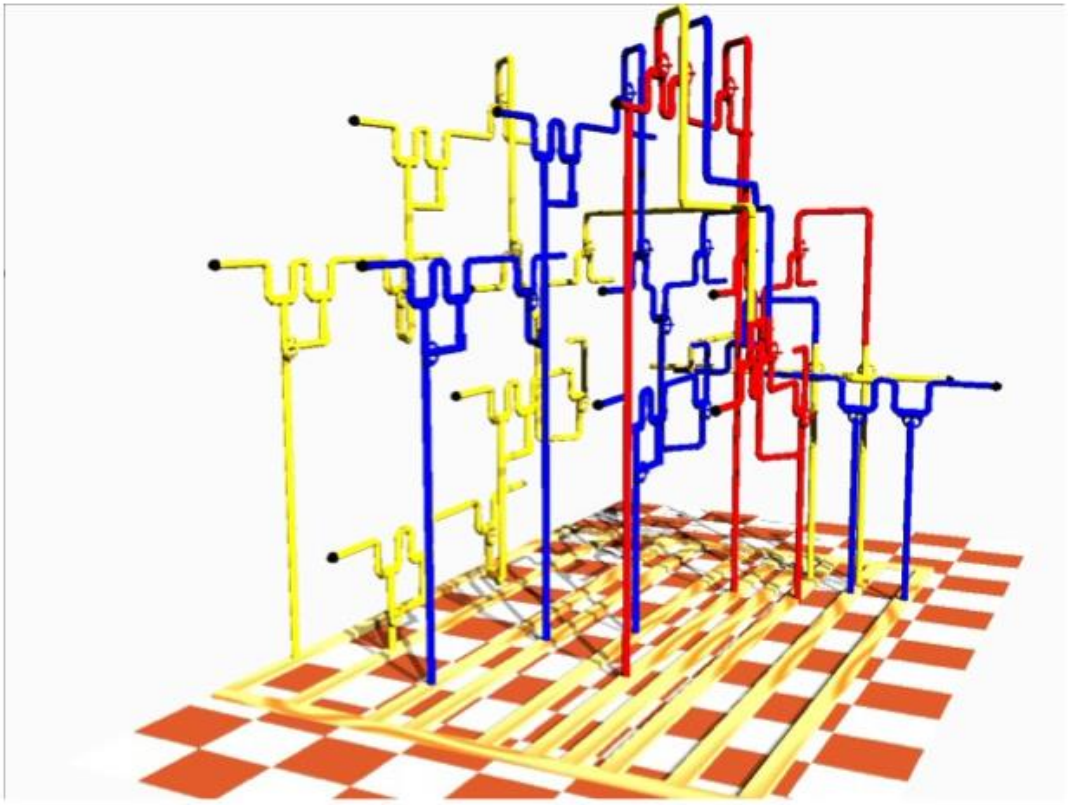
Considering *Rollout* and *Engine Abstraction*, issues of representation and abstraction cannot be avoided. *Analog Engine* itself is an abstraction of symbolic logic functions, but it is also a very physical realization. When it is placed in the engine bay of the *Red Truck*, which is more clearly representational, it blends seamlessly into the environment, but when the Engine is focused on by itself, in a manner similar to a camera highlighting the weave of a carpet its abstract qualities are obvious.

I became dissatisfied with the back-wall-support idea. From rotating the Engine around and around in CAD/CAM space, I came to the conclusion that the back was as interesting as the front, so I began thinking about making the Engine self-supporting.

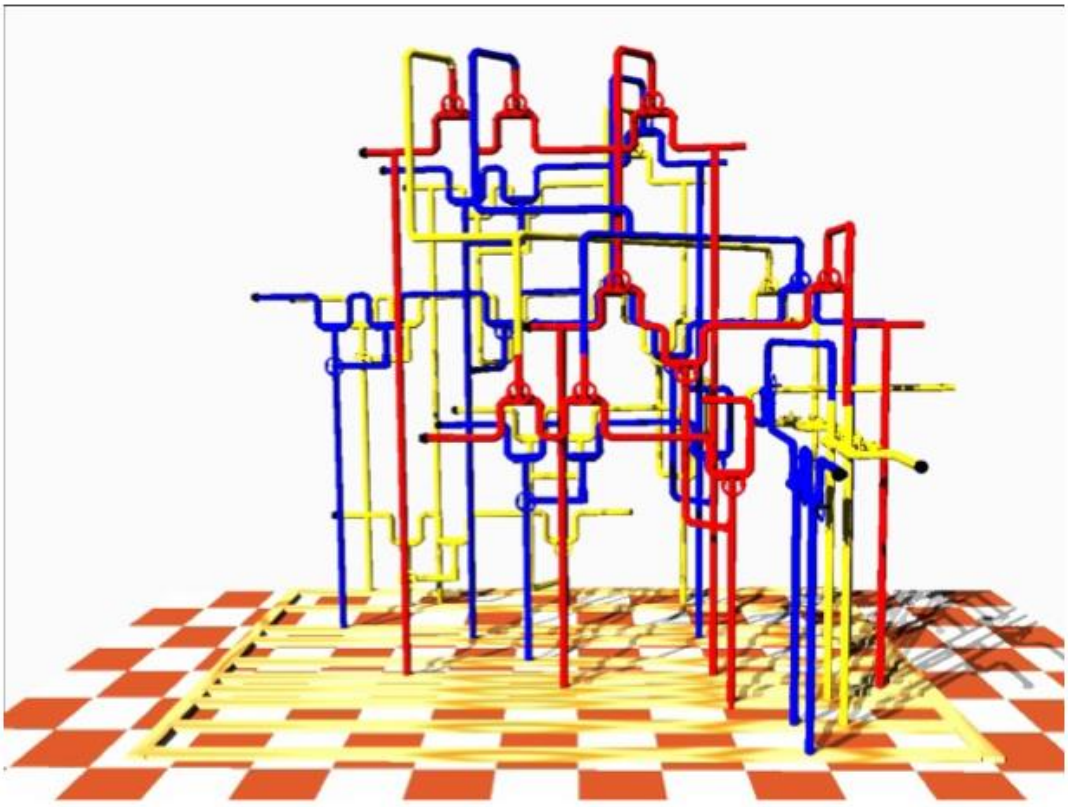


Red Truck by Fred Truck

Isometric Projection View



Counter-clockwise Rotation

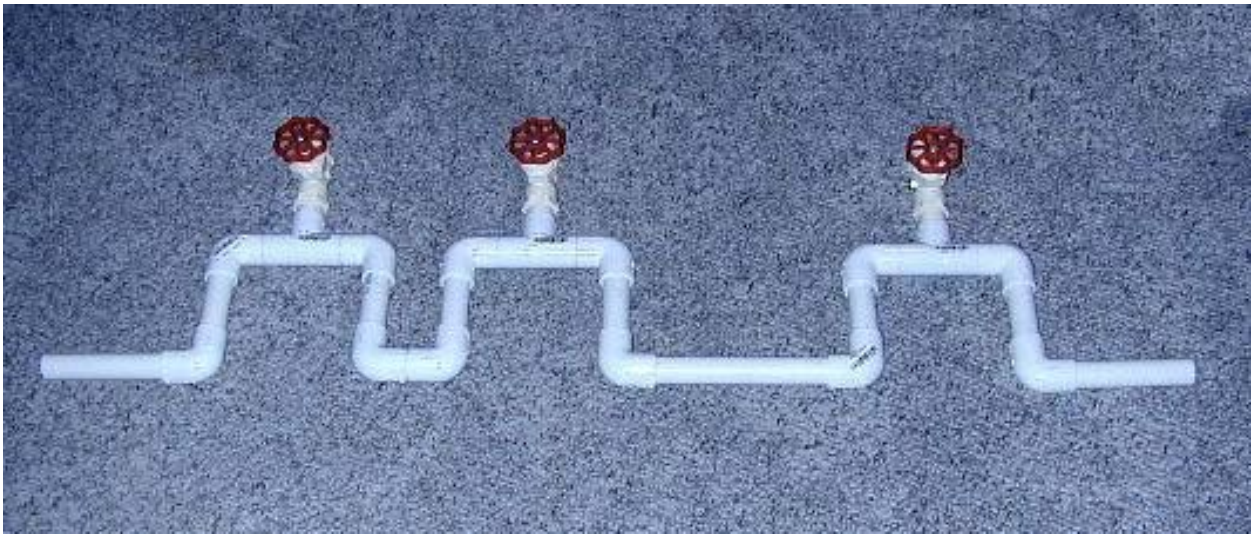


Front View in Perspective

These three images show the base design I came up with that I thought would make the Engine stand on its own. I extended some input pipes to the floor, reasoning hypothetically that the steam source would be hidden the next story down. I added a few additional vertical braces, which I colored the same as the layer they supported. The problem with PVC pipe, as anyone knows who has worked with it, is that though it appears to be rigid, it actually has quite a bit of flex in it, as any pipe made for conducting water does. This means that any structure built from PVC pipe will not support its own weight without flexing. I thought that if I made a wood frame from 2x4 pine, and accurately measured where I wanted the vertical supports to be, I

could drill holes in the pine, which would then brace the PVC against its tendency to flex.

I finished these designs in August of 2000, and then thought about them for almost two years. During that time, I built some test "gates." Their construction was routine. But painting them turned out to be difficult. Basically, the only thing that will stick to PVC is PVC-based paint. I had envisioned all kinds of pearlescent finishes, but it was not too be. Later, I did some research and discovered that latex paint adheres well, but it can't be acrylic latex. It has to be latex, period. I found some glossy latex paint that was fabulously laden with pigment, and tested it. It worked quite well.



A test gate

On July 5, 2002, I began building the sculpture. I still did not know exactly how my base would work, but I knew it would not be made of wood with holes drilled in it.

I began with the back layer of the machine, the yellow layer.

I decided I would make everything from PVC. Using the rear isometric projection as a guide, I built the yellow layer and found it would not stand on its own, so I kept adding braces and supports until it did. I

then connected the vertical supports with an ad hoc rectangle, doing whatever I needed to do to make the layer stand.

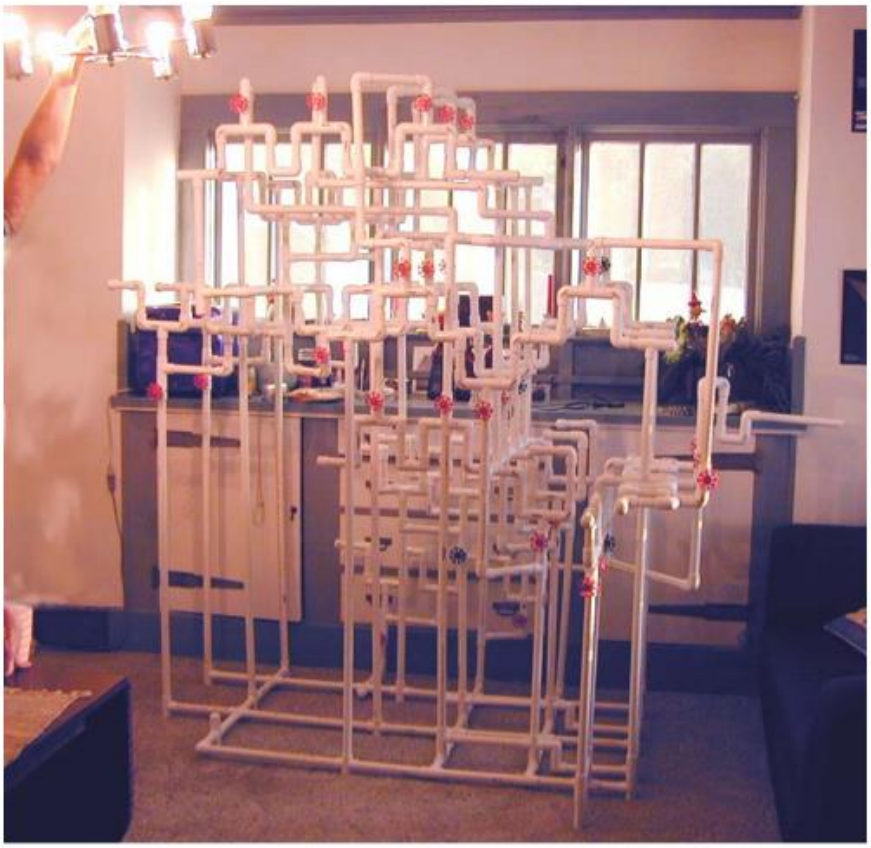
The results were amusing. The verticals still bowed, and sometimes the horizontal gates sagged. I also found through the process of moving the layer from my basement to my living room to my dining room to the back yard, which required disassembly and assembly frequently, that no matter what I did, I could never force the PVC to go back together again the way it had been before. PVC seems to breathe, and how level the floor was that I put it on affected it greatly. Nevertheless, I found this quality pleasing.

Steam Engines and the *Analog Engine*

I grew up in Mt. Pleasant, Iowa, a small rural community in southeastern Iowa. One of the seemingly few advantages of growing up there was that I was exposed at an early age to antique steam traction engines used on farms from the late 19th century up until World War II for threshing. In Mt. Pleasant, every fall, there was a huge festival celebrating these machines and the people who worked them called The Midwest Old Settlers and Threshers Reunion. From its inception, when it was mainly a gathering of a few wealthy farmers with some time on their hands after harvest who loved these old machines and saw it as an occasion to bring their families together to have some fun, to when I left Mt. Pleasant, and the Reunion featured hundreds of steam engines and drew thousands of people from all over the world, I have been fascinated by these roaring hot, hissing giants and their incredible power.

As a child, playing on the Avery Undermount Steam Tractor, I learned firsthand that nothing on those machines was straight. Practically everything was handmade and aligned by eye. Peering through the cab window, down past the long barrel of the high-mounted boiler, I could see the pipes running along it were bent and distorted by heat and accident, the usual stuff of daily work. These memories came back to me in force as I considered where to lay the next brace on my wobbly yellow layer.

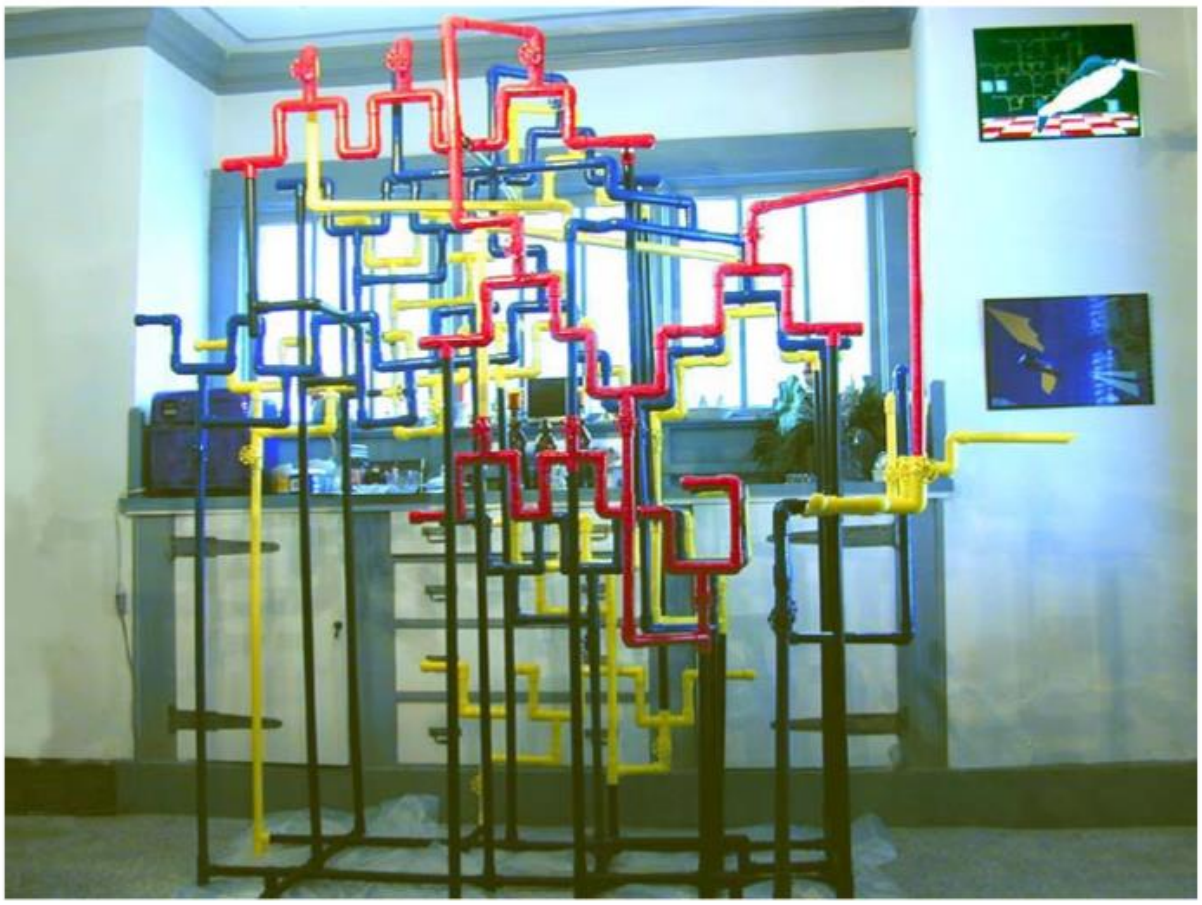
I planned, early on in the construction, to distinguish vertical and horizontal supports from vertical input pipes by painting the supports flat black, as well as the rest of the support structure. The input pipes bore the same color as they layer they fed. This decision continued my basic color code design and made it possible to trace a path steam traveled for almost anyone.



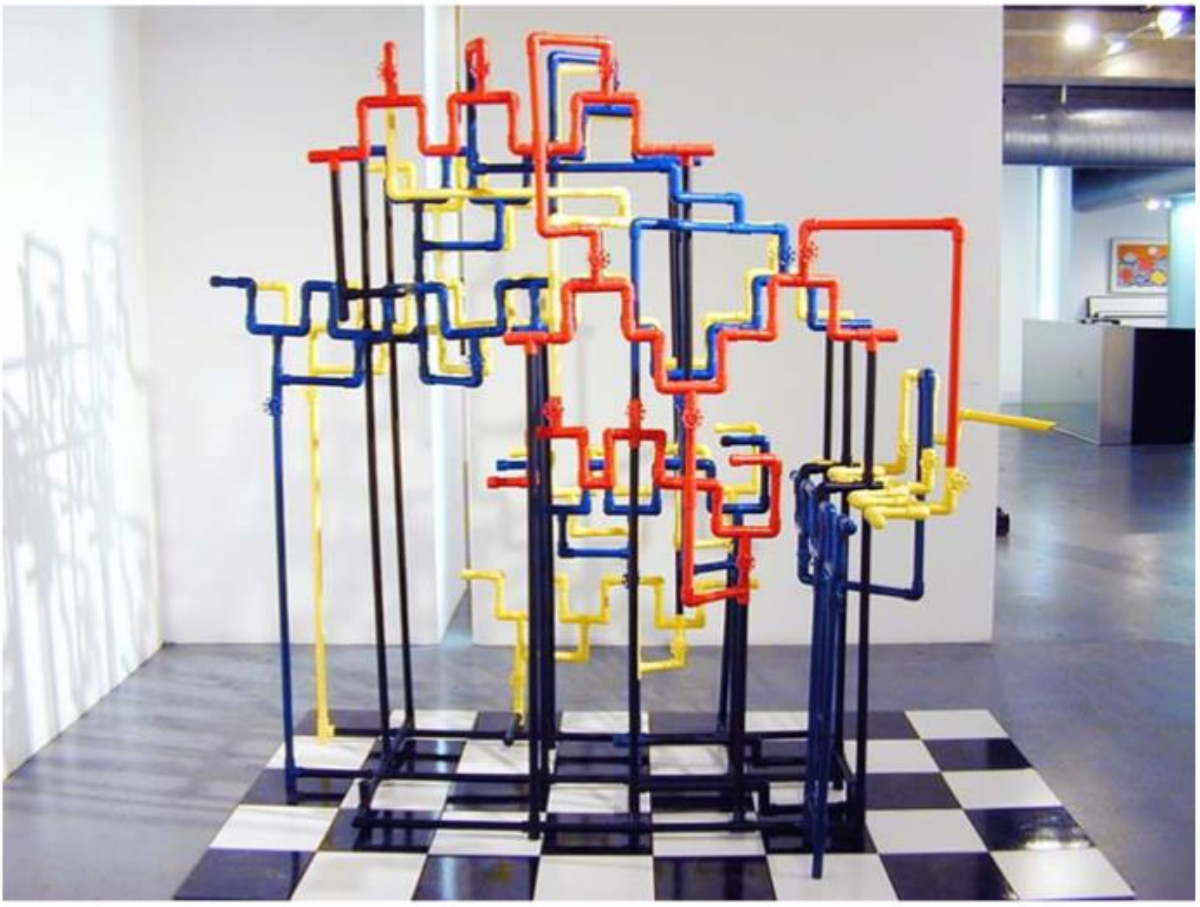
Analog Engine, Unpainted

Overleaf: *Analog Engine Painted*, In the Dining Room

Red Truck by Fred Truck



Everyone should have an *Analog Engine* around the house, don't you think?



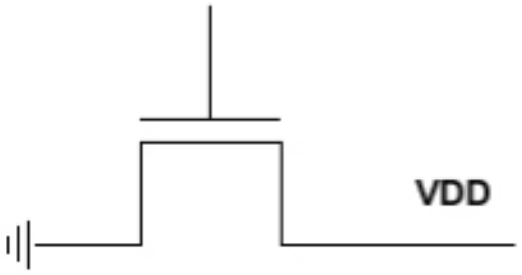
Analog Engine is 83x97x44 inches resting on a base that is 60x96 inches. The sculpture is made of PVC and gloss latex paint. The base is ceramic tile. Installation view at Karolyn Sherwood Gallery (formerly Steven Vail Galleries), November, 2002 through January 2003.

Addenda

Analog Engine (the sculpture) was destroyed when it was moved to a new storage facility. The *Memory Device* was also destroyed in that same move. Both could be easily rebuilt should the occasion arise due to the documentation contained in this text.

Technical Assistance

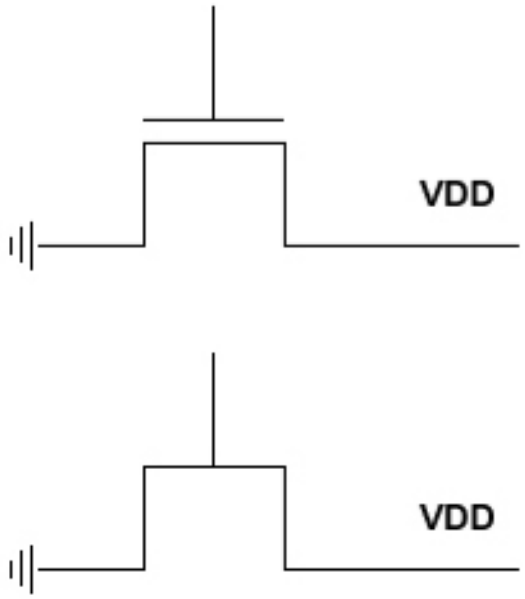
All three stages of *Memory Device* design are composed of an array of on/off switches or transistors, represented by this type of diagram, often used in electronic engineering:



This on/off switch is a transistor. What interests me here is not how transistors actually work, but what they look like in this picture, and what kind of associations their appearance may lead me to.

Having said that, it is still important to understand that this switch has an ON state and an OFF state and that, in actual transistors though no part actually moves, the language USED to describe transistors implies movement. That is, the switch is referred to as a gate and when in the ON state, the gate is said to be OPEN, and when in the OFF state, the gate is CLOSED.

The "open" and "closed" language used in describing gates led me to imagine pistons:



I imagined these gates to be powered by steam, with an actual piston making its on and off states. My early designs for the *Memory Device* used just such steam-powered pistons.

Why steam? Why not electricity or at least gasoline?

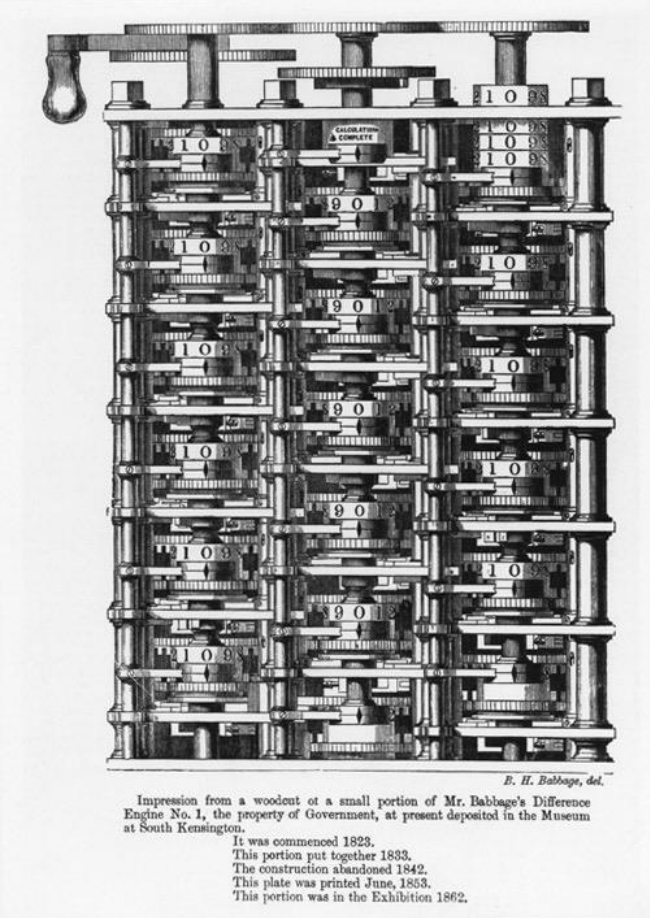
Well, there is history to consider. There is a historical precedent for steam-powered computers.

Charles Babbage

Charles Babbage, an English mathematician and inventor, was born in 1798. He invented the Difference Engine, a steam-driven calculator, in 1821. He later developed the Analytical Engine, an improvement on the Difference Engine, which was designed to solve any kind of mathematical problem. The Analytical Engine received instructions on punched cards, performed its calculations, and printed them out. This description sounds much like a description of early mainframe computers. Due to his frequent changes in design and the lack of precision machining necessary to build the machines he designed, and

the lack of support of the British government, Babbage was never able to complete his Analytical Engine. However, using Babbage's designs for the Difference Engine, George Scheutz, a printer from Sweden, built practical versions of that machine in 1854, which were used by both the British and American governments.

Charles Babbage appeals to me not only because he was far ahead of his time, but because he was able to order a number of available technologies of his time—steam, mechanical technology and design—towards the solution of a vexing problem. The specific problem that irritated Babbage so was that human computers made too many errors in figuring logarithmic tables. He reasoned that a steam-powered mechanical calculator would not only eliminate human error, it would be faster. He was also a visionary who foresaw that it might be possible for a mechanical calculator to work in the realms of symbolic logic.



B. H. Babbage, del.

Impression from a woodcut of a small portion of Mr. Babbage's Difference Engine No. 1, the property of Government, at present deposited in the Museum at South Kensington.

It was commenced 1823.
This portion put together 1833.
The construction abandoned 1842.
This plate was printed June, 1853.
This portion was in the Exhibition 1862.

As an artist, using steam as a power source enabled me to solve the problem of scale. Contemporary digital computers are marvels of nanotechnology, but working on a microscopic scale is not the most direct way to create a powerful visual impression. Translating the visual patterns of the designs for electronic circuitry from electronic power to steam power enabled me to build the circuits as large as I want.

How *Art Engine* Worked

Given two images, if the kernel of a program treated images and the words describing them as the same thing, it should be possible for the program to create a new third image from the two given images by changing the words.

I devised a process in which each part of each image had a unique name. This name appeared in a list of image parts. When the list was evaluated, the image was drawn.

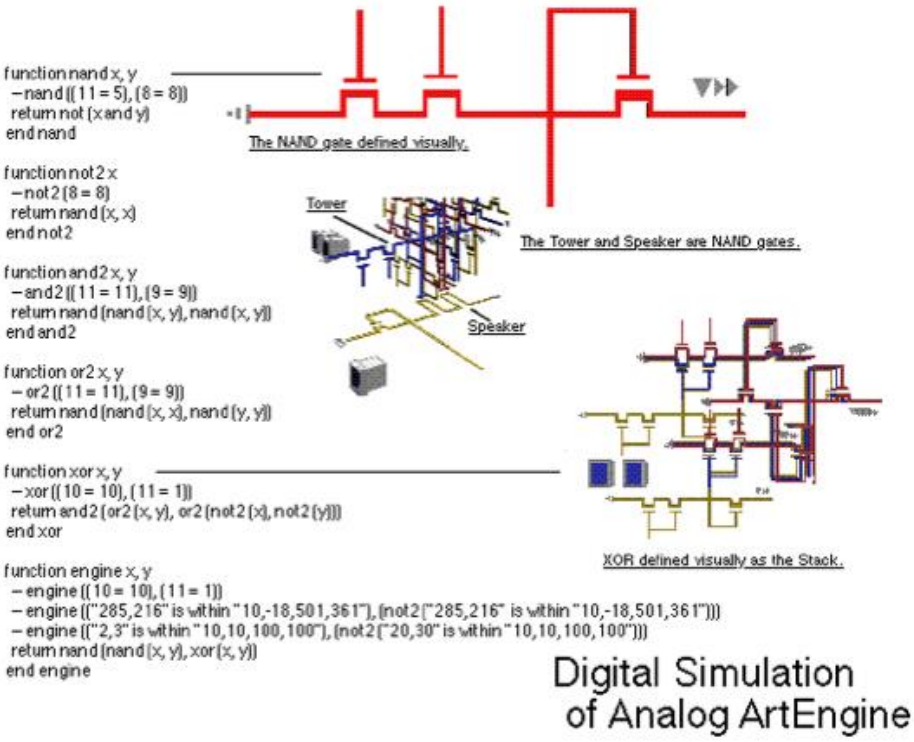
By comparing the lists of parts, *ArtEngine* could determine where the two images were identical, and where they differed. The Engine wrote a new list, and created a new image.

I used MacScheme, a dialect of the Scheme programming language small enough for the Macintosh computer. I worked on my project for the next 5 years. I abandoned it in 1991, when MacScheme became obsolete because it used reserved addressing spaces necessary for 32-bit implementation that Apple was embarking on.

ArtEngine became an orphan. I have printouts of the original source code, but nothing else remains except the ideas.

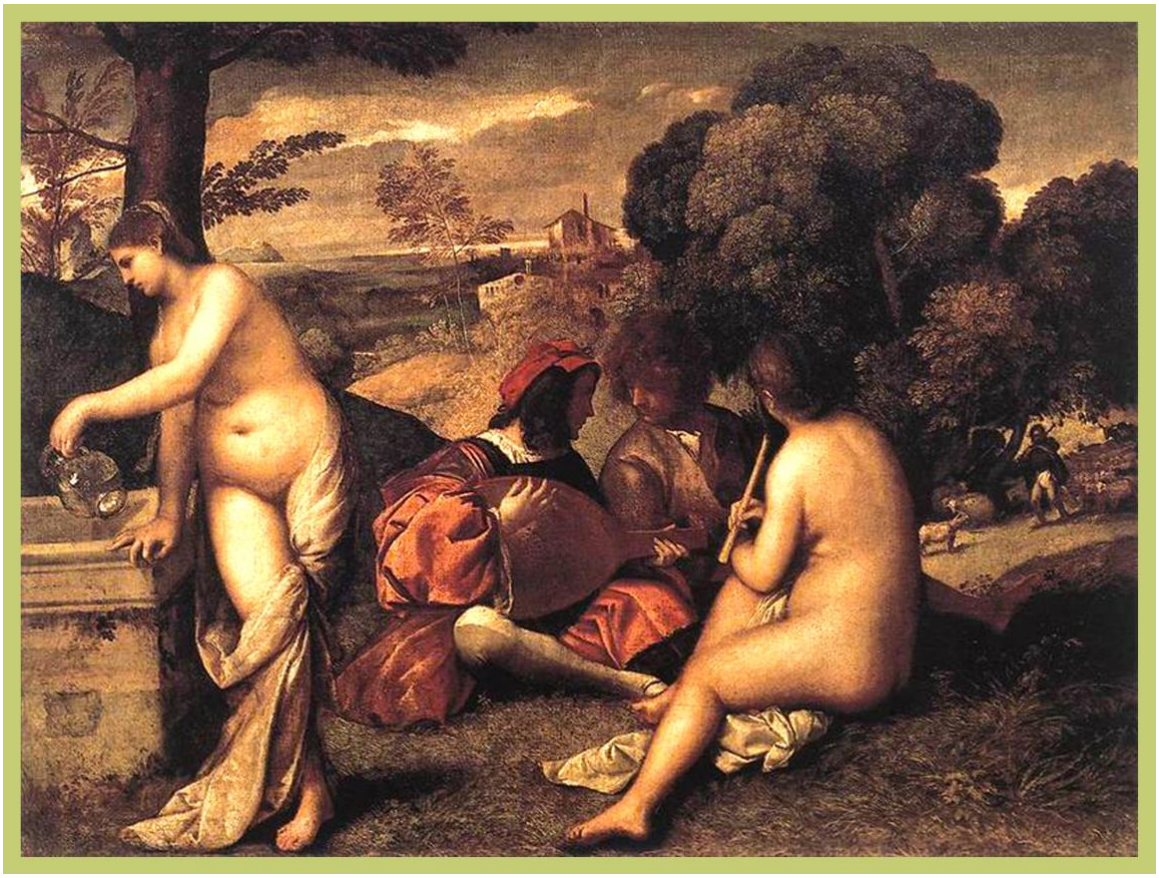
Duchamp Playing Chess

The last project I worked on for the *Engine* was a comparison of The Concert by Giorgione or Titian and Julian Wasser's 1963 photograph of Marcel Duchamp playing chess with Eve Babitz. Though it was never run on the fully featured Engine, I did run it on a much-reduced Engine simulation done in the HyperTalk language.



Images

Red Truck by Fred Truck



This is the primary image. It is always drawn first.

Red Truck by Fred Truck

This is the secondary image. It is always drawn on top of the primary image. I colorized Wasser's b&w photograph and faded most of the picture, because the full-color central image is all I wanted the Engine to see.

In using the *Engine*, graphics must be edited before a synthesis is tried. At this time, the process is done by hand.

Lists

Then, I made lists of what interested me in these pictures.

	Giorgione	**Babitz/Duchamp**
media	painting	photo
activity	music	chess

female	2 nude	1 nude
environs	pastoral	art gallery
time	music	clock
male	2 musicians clothed	1 chess player clothed
male focus	music	male-game
female focus	listening, pouring water	female-game
eroticism	platonic between men involved in music	failed consummation in Large Glass, 56 yrs difference in age between chess players

These lists are presented to the *Engine* in this format:

((media painting) (activity music) (female 2-nude) (environs pastoral) (time music) (male 2-musicians-clothed) (male-focus music) (female-focus listening-pouring-water) (eroticism platonic-between-men-involved-in-music))

((media photo) (activity chess) (female 1-nude) (environs art-gallery) (time clock) (male 1-player-clothed) (male-focus male-game) (female-focus female-game) (eroticism failed-consummation-in-large-glass-50-yrs-difference-in-age-between-chess-players))

Taking a closer look at the format of the list, in each group inside a parentheses (male 1-player-clothed), the first term as **male** is a category, while the second term, **1-player clothed**, when evaluated, draws that part of the picture.

It is better in practice to keep the pieces of an image to a minimum. That being the case, I combined as many parts as possible into a single fabric, as:

(define babitz-duchamp ((photo) (chess) (1-nude) (art-gallery) (clock) (1-player-clothed) (male-game) (female-game) (failed-consummation-in-large-glass-50-yrs-difference-in-age-between-chess-players)))

This procedure would draw the entire Wasser photograph.

Once *ArtEngine* has made the synthesis, what will the picture look like?

Here is the list the *Engine* generated to produce a synthetic image. The *Engine* operator does not work out the synthesis list beforehand. The *Engine* writes the list as the program is running.

((activity chess) (female 2-nude) (environs pastoral) (time clock) (male 1-player-clothed) (male-focus male-game) (female-focus female-game) (eroticism failed-consummation-in-large-glass-56-yrs-difference-in-age-between-chess-players))

Results

When parts of the secondary image (Babitz/Duchamp) are superimposed over the primary image (Giorgione/Titian), what has been removed from the secondary image, and what is now visible from the primary image define the synthesis.

Red Truck by Fred Truck