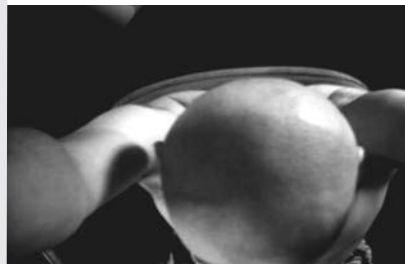ROTHKAMM

FB01

This is the beginning of the digital age. Computers are not instruments. By definition, they are general purpose machines of the empirical world and their nature changes according to the instructions given. The series of instructions, the algorithm, determines the machine or what the machine is. The algorithm can exist *in abstracto* - in a world of transcendental ideas without machines. However, it can only execute in hardware, not apart from it. At the moment of execution the algorithm changes the nature of the general purpose machine to a special purpose machine, gives concrete evidence of a transcendental idea, and manifests itself in the empirical world of time and space. This change of general purpose to special purpose is the instrument, the manifestation of a transcendental idea. Implicitly, instruments are defined by limitations. Limitations clearly shape the instrument and dialectically, the more limited the instrument is, the more it expresses the idea. This is the reason for aesthetics to emerge, because they are born at the moment the special purpose machine executes very particular instructions. Aesthetics are particularities in the empirical world and it is only because of their particularity that they are capable of cosmological manifestation as they are absolute expressions in a world that is limited to time and space. Aesthetics are therefore bound to the machine. What we listen to is the instrumental machine. What we listen to is the Digital-to-Analog Converter. What we listen to is what the machine is. It is the algorithm that enables us to move with absolute freedom through the empirical world of the machine as if at play without purpose and with cosmological ideas in mind; that is, free improvisation that is free from free improvisation. If we suppose a purpose it is our liberation through the instrument. This is our play with, or our intuition of, the machine as an instrument of transcendence to the cosmological idea - as instruments are spacecrafts, vehicles to manifest the reaches of the cosmological ideas.

The design is supermodern: minimal outside, feature and function rich inside. The year is 1986, the country Japan, and Yamaha introduces a first generation digital synthesizer module: the FB01. It looks like a car-stereo, as there is no keyboard and only 8 pushbuttons. A small backlit LCD display with orange type is the only indication that the module is on. All of the FB01's supercomputing power can only be accessed via highly compacted bit-masked system-exclusive MIDI-data. Inside the module is the 8-bit YM2164 sound chip that was also built into the CX5M and into coin-operated arcade machines like Total Carnage, Judgment Day 2 & Mortal Combat. The synthesizer implements a form of Chowning's Frequency Modulation synthesis. The sound is digital, as there are no traces of subtractive synthesis which had dominated the industry during the 1960's and 1970's. The FB01's Digital-to-Analog converters are 10-bit YM3012. These are the major part of a very particular digital sound: quantization is audible, as well as the residual noise of the synthesis itself, as frequency modulation relies on Bessel functions to compute sidebands. Although probably never imagined by the engineers at Yamaha, the FB01's exhaustive MIDI-implementation allows the real-time change of almost all sound parameters without audible artifacts. Its Low Frequency Oscillator, which includes a random signal generator, can go from control signal to the lower regions of wave-modulation. Perhaps because of the sound chip's intended use in arcades, this very peculiar feature was implemented so that complex sounds can be computed with minimal effort. In this age of emulators which is 2nd generation digital, the FB01 remains the ancient technology from the future.

$$\lim_{1 \to I} \sum_{fb01 \geq 1}^{iform} I \subset C$$

In the summer of 2002, I began to envision music without reference to popular or underground culture, up to which point had been my *modus operandi* in San Francisco, New York and Hollywood. I thought of this new music as being completely synthesized with no imitational reference to anything in the empirical world. It should also be created directly to a recording medium with no reference to preconceived forms and with nothing but intuition and transcendental ideas that in turn were to be axiomatic during execution in time and space. Furthermore, it should be played pianistically with absolute freedom from sine waves on upwards (cosmological synthesis) and its polyphony should be multi-tracked from only one electronic source, to remain self-evident. So I went back to the origins of purely electronic music, my origins in the CX5M and the original methods of modernism, as put forth by the Cologne school. This most abstract, and in many ways most primitive, form of pure electronic music should form the basis upon which I would apply my theories on random processes that I have been formulating since 1988 in the computer language Forth. This solidified two concepts: supermodernism as a transcendence of modernism and Iform as a language of retro-computation. The foundation is ancient technology to take it beyond its furthest reaches; to become more primitive than its most primitive and to become more complex than its most complex, so that its most complex becomes primitive and its most primitive complex.

Let there be 2 ratios with an equal probability of occurrence. As a sequence this can be described as a binary rhythm, as the 2 durations are chosen by the toss of a coin. Independent random events with 2 possible outcomes are described as a Bernoulli trial, therefore the binary rhythms are a Bernoulli process. In biological terms, this can also be described as a sequence of base pairs or DNA. Base pairs form only between the nucleotides A and T and between G and C. Expressed in terms of Iform: 4 discrete values that form 2 ratios: two pairs of x/y. Each pair is a ratio and there is only a sequence of two distinct ratios. This sequence moves in time without a dominating pulse -- is free from a master clock or the division of time into even divisible segments. The ratios are irrational. Irrational ratios have no common denominator and are computed indefinitely, i.e. $1/3 = 0.333...$ If there is a sequence of irrational ratios, i.e. $1/3$ & $1/15$, their movement in time is out of sync with a master clock or independent of the model of time as a sequence of distances with a common denominator. One ratio can not be explained through the other or via a common third. This sequence of Bernoulli-trial-generated-irrational-ratios is biological, the movement of a creature with odd legs. If we assume a parallel multitude of irrational ratios or many independent but simultaneous irrational rhythms, we arrive at the music of the "Lizard People", named so because their existence is not comprehended by reason alone, but with the aid of the irrational. The basis for the rhythms of the Lizard People is a binary sequence of irrational ratios as lengths of time; the parallel but independent occurrence of such sequences, related to the empirical world of tribal or collective rhythms where each player makes up his own pattern. This basis however is in flux. This means that at any given point in time one of the numbers of a ratio may change. This change of ratios at any time leads inevitably to the irrationalization of irrational rhythms.
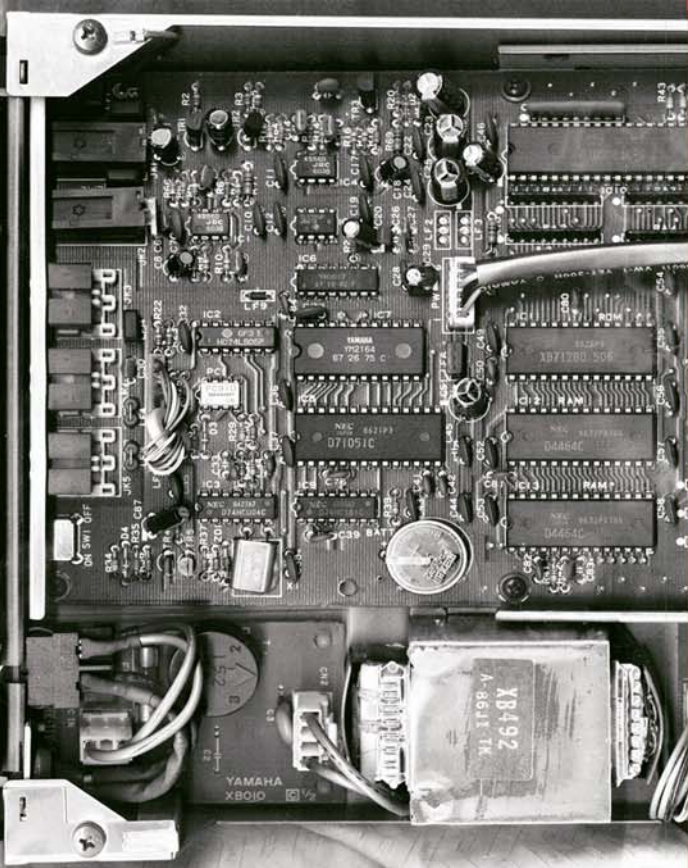
rothkamm FS01

A

V_3

V_1

V_2

B
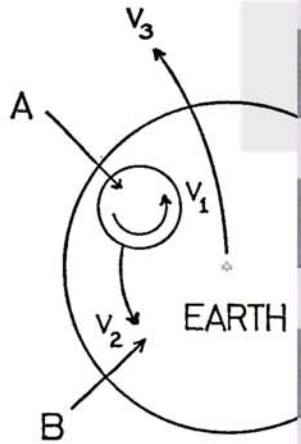
EARTH

1. 0.07
Incident Outside Mesquite

0.07
Message from Space Mountain

0.07
Independent Bernoulli Trials

0.07
Earth Frequency Oscillator

0.07
Binary Rhythms of the Lizard People

11. 0.07

12.

13. 0.07
Atmospheric Composition

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