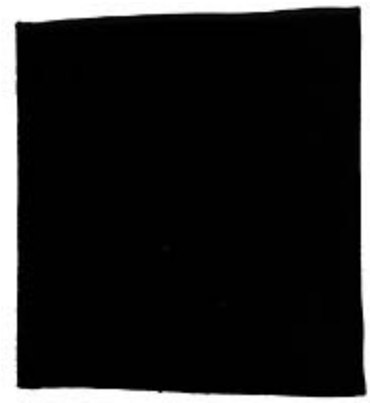
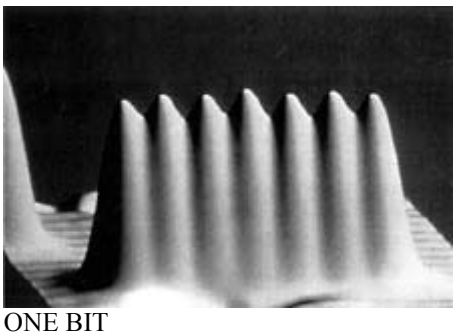
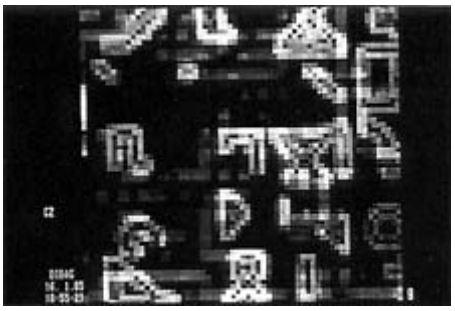
Binary notations for digital architecture
MANFRED PLOTTEGG



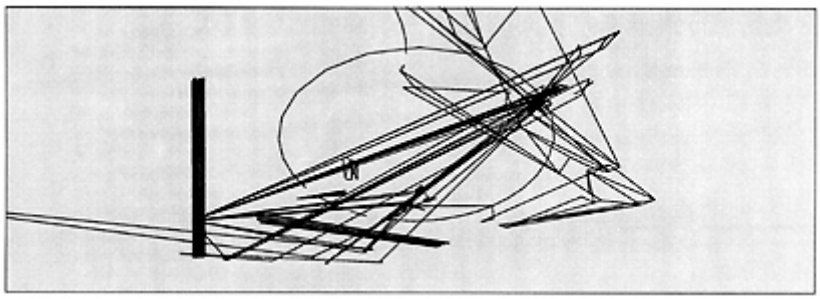
ONE PIXEL (black, felt pen on pape, analoguous hand-drawn sketch by M. Plottegg 1994, original in red in 1985)



ONE BIT
Photo: IBM research laboratory 1990



PIXELS for cemetary 1986



Synthetic dimension through data crash (Plottegg & Kupelwieser 1991)

We have become used to the fact that architecture is spatial information; essentially this algorithm is based on the principle of analogies — a church looks like a church, a house like a house, a bed like a bed.

Architecture is also used as a signifier which conveys "what is meant" — glass is transparent, wood cosy, concrete brut, niches and protect, corrugated iron is suburban.

The degree of sophistication of buildings echoes the level of education of the architects. They coquettishly toy with ideas such as personal touch, individual taste, antiquatedness and representation. Their perspective is obsolete (up / down; inside / outside) and their methods outdated (prototype: hand-drawn sketches). Architecture is not in touch with novel scientific and cultural developments, and the architectural theories it employs are divorced from the object.

The complexity so often cited by architects essentially results from the dearth of real arguments in their wordy proclamations. Their image of limit consists of incredible contortions. Yet, at the same time they still want the golden section, utmost loyalty to the materials, functional functions, the pure style, definite constructions.

Thus, the history of architecture came to a halt when it reached the image of limit of the semi, as a designed individual object, a subset of sprawl. As a category it is present in all architectures, no less in St Stephen's Square in Vienna than in Hongkong Peak, in reductionist minimalism just as much as in opulent actionism.

The CPU makes it easy to throw away these personal and system-inherent images of limit. CAD = CTRL-ALT-DEL for the still omnipresent Vitruvian theorem (the trinity of function/form/construction), for the analogous algorithm of the "semi/taste/architecture".

The CPU requires the user to adopt novel manipulations, which are not focussed on, nor indeed aimed at the object or the subject (user), but on the architectural algorithm itself. Because the first step of dealing with an architectural problem involves the conversion of a task ("Build a house") into a digital command, a reformulation of the task for the computer, which can then act on it. This first phase in the planning process is more than just the transformation of information for the computer, it also means the architect has to switch to new planning methodologies, from a content-analogue-based approach to an interactive-digital one. The very fact that the problem has to be reformulated will therefore prompt a major change in the architectural paradigm and also produce new architecture.

In other words, architects have to switch their preferred archetypical views of themselves from "home-building know-all" to "data manipulator". Indeed, go even further, leaving behind their love of subtle detail, the identification of one's own personality in architecture: the rules of the game in communication technology are no longer determined by emotionality or subjectivity but by the innate characteristics of the CPU. Buildings and details are no longer wishes and desires come true, no longer the receptors of dreams. The direction of the information flow is reversed. If architecture today still provides spatial information by definition, what kind of spatial information do we receive from pixels and bits?

The pragmatic perspective relies on signs, which act as tokens of something, as signifiers. In conventional designs, certain well-established conventions define how letters have to be interpreted, for example as words, lines, as the margin of the paper, two parallel lines for example as a wall. Such interpretations, however, rely on the reader's cooperation in the communicative act (Why are parallel lines at the edge of the paper not interpreted as a wall? A considerable degree of cooperative effort on the part of the communication partners is necessary if "correct" communication is to be guaranteed.)

Binary lines are devoid of content. Not even when closely scrutinized through a microscope or zoomed will it be possible to identify the content. It is precisely because they carry no meaning, because they are not yet charged with specific connotations, that they are easy to manipulate. Diverse interpretations are therefore possible: they can be read as an individual line, as a set of lines, as a matrix; three-dimensional spaces can be read as two-dimensional surfaces, just as two-dimensional surfaces can be interpreted as three dimensional spaces. In the binary house context, the characters and symbols of the record do not carry meanings. Lines are first of all lines, they are visualizations and yet have no meaning. Lines are just random strokes across the screen.

A point always remains a point, regardless of which geometric representation we are dealing with (cf. a sphere). The implication for the screen is that identical pixels can at the same time be their own ground plan, elevation, section etc. The corollary of this is that the lines on the screen, the design drawings of the binary house, can be simultaneously read as the ground plan, the elevation, the section, the axonometric projection or perspective representation.

As no conventions have as yet been developed, which define how pixels and bits have to be read they require an active effort on the part of the receivers. We have to find a new "way of reading": The informational content of a bit is strictly distinguished from the spatial information carried by a bit, i.e. the familiar identity of three-dimensional form and information is suspended. A bit does not represent a hill, which means that doors in digital architecture will no longer look like doors.

Regardless of the content — as conventional analysis would term ist, digital architecture implies:

The absolute dimension for drawings of the binary house is one pixel, for the CPU it is one bit. The binary house itself — although it exists is devoid of dimensions. The fact that it has no dimensions is directly related to the fact that the lines have no labels. lf we define dimensions in such a dimensionless world, we impose selections which are not inherent in the system.

There are no more sacred places, no places which carry meaning. Heaven is no longer up there, and hell no longer down there. Orientation in the 3-dimensional data array changes with every new system of coordinates which is introduced, and when zoomed scales and dimensions dissolve in the dilatation invariance. Spaces are no longer boxes, rooms no longer squares, we can emancipate of the constraints of the place because formal language dissolves and with it analoguous architecture.

The CPU compresses the time to simultaneity in which the computer has no selective memory. Computer memories have no mind for history, they make no value judgements.

In a timeless space there is no memory, no lessons are drawn from history. A space that is devoid of meanings passes no value judgements. And therefore lacks the basis for derivation. The binary house is not hereditary, it simply has no principle.

A bit is pure memory (storage, but no analogue-content-based information), a pixel has no memory. Both are at our disposal for manipulation — a paradigmatic shift in architecture — from brick laying to data manipulation.

Different systems (subsets) would interpret certain information differently (the spatial information of a corner would appear differently to a dog), the computer does not sniff out subjectivity, a digitally generated line has no intrinsic meaning.

Nowadays data, lines, forms of architecture can be generated digitally. What we have to do now is find new theories of how to deal with these lines. Even our behaviour in a binary house in 3-dimensional space will be very different from wall-oriented codes. Networks (string vests) are replacing the concept of architecture providing a "third skin".

The generated string vest not only provides information and enables communication like intelligent walls, but it also echoes — in line with fuzzy logic — a new approach to architecture namely, rag-ball architecture.

Definitions are characteristic of conventional designs, and thus the latter become formal systems. A binary/digital architectural design is a change of the algorithm in a system, which then results in a new image of limitation.

Occasionally, intensive use of computers affects architectural design methods. Yet, in order to ensure that obsolete theories do not get in the way of new developments we urgently need a new digital architectural theory, which should include the following axioms:
The binary house only exists in the CPU.
Binary lines are devoid of content.
Drawings of the binary house are ambiguous sketches.
The CPU provides the formal idiom for the binary house.
The binary house itself has no place in an environment devoid of a viewpoint.
As the lines have no names they have no function.
The binary house itself has no dimensions.
The CPU reduces time to simultaneity.
The binary house is simultaneous and timeless, it is not hereditary.
The binary house has no object, it is dematerialized architecture.
The binary house can be built.
The binary house is autonomous architecture, communication, the string vest and the rag ball.
It knows no preconceived images. All called-up pictures are equally valid.
The CPU works without bias and this is the way it wants to be used.
It demands that the designer detach himself from content-based attitudes.
The CPU produces endlessly with consistent quality, and the outputs don't improve each other.
Abstraction ought to be retained as long as possible.
In an inventive way, novelties and misunderstandings are maintained.
Naming determines the function.
Additional formulations can be found in recycling.

Interactive architectural production is a cornucopia. Today the world's network is so tight that even poor designs are caught in the net!