GRAPHICS APPLICATIONS IN THE ENVIRONMENT: GROUPE COULEUR DE BELFORT

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FORMATION OF THE GROUP

The Groupe Couleur (or Color Group) of Belfort was originally formed in 1968 by the painters: Kammerer-Luka, Nadal, and Normand. The group proposed to work with those responsible for the humanization of the industrial and urban environment in the Belfort region, working through the medium of color.

The originality or uniqueness of the Belfort group lies in the practical aims of its research and creativity. taking art into the environment of the citizens. Thus we are continuing the ideals of the Bauhaus in Germany, whose great work began at the beginning of this century.

The Groupe Couleur, acting as a link between conceptual creation and final execution, works in collaboration with architects, planners, and institutes, etc., and increases contacts with the inhabitants of Belfort and its students, involving them in our projects. Our aim is to integrate the lifestyle and urban background of the Belfort citizens into artistic creations that are a vital part of the environment.

After two years' efforts, amidst certain difficulties that included variables outside our control, the first realizations of our work saw the light. Some of these variables were: decisions, financing, and attitudes of the public authorities, users' receptions to our work, etc.

CHRONOLOGY OF EVENTS

Before discussing some of our varied projects in detail, a brief chronology of our efforts is given:

ABOVE: G. F. Kammerer-Luka, Animateur, Groupe de Belfort; Marcel Kibler, Professor of Mathematics; and J. B. Kempf.

1969 - Sensitization campaign, with conferences and
1970 exhibitions. First realization: planning of external and internal color scheme in the Mechanical Workshops of the Social and Interprofessional Center at Exincourt, Department 25.

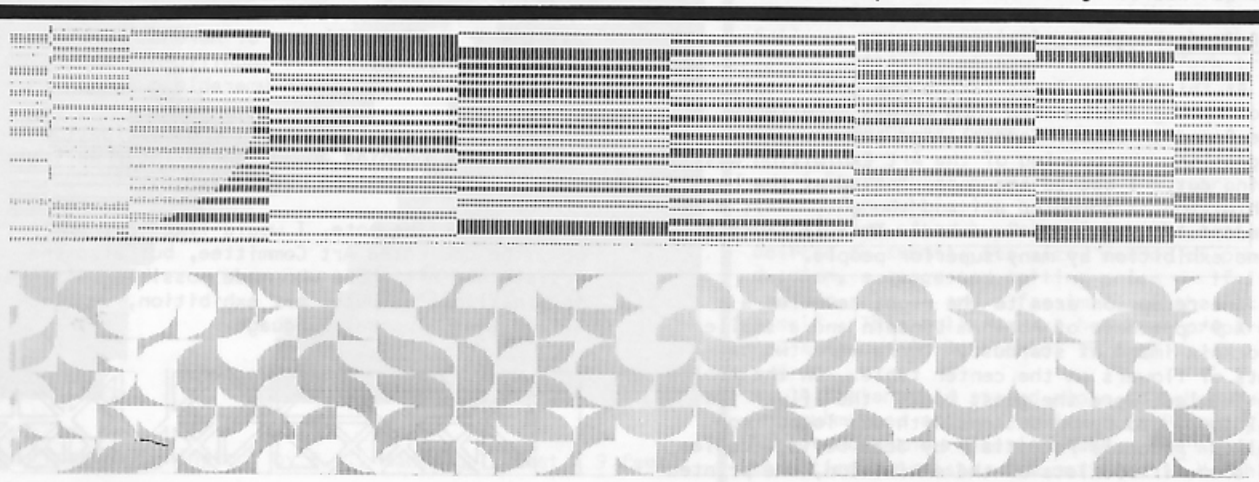
1971 - Foundation of a civic society, the Groupe Couleur de Belfort, with G. F. Kammerer-Luka, Claude Noll, Yves Normand, and Anne-Marie Quemar.

Realization: Color scheme of the Z.U.P. (Council Flats Estate) in the Glacis district of Belfort - program of 300 flats.

1972 - Study for the subway at the Belfort station, with collaboration of J. B. Kempf and Marcel Kibler and new computer-aided research.

Color scheme for the Mechanical Engineering Workshop at The Technological Institute,

BELOW: A study of the "monumental tapestries" or murals for modular decoration.



Couthenans, Department 70 -- School plan and external color scheme.

1973 - Computer-generated mural decoration for the entrance hall of the Engineering Department of the Technological Institute at Belfort.

Color scheme for the second section of the Glacis Estate, a program of 600 flats. Glacis school, color scheme.

Participation in the SIGMA 9 Exhibition, "Art and the Computer" in Bordeaux.

1974 - Participation in the "Art and Computing Exhibition" in Angers.

Research into modular art with regard to its application in industry.

A GROUP OF ARTISTS WORKING WITH COMPUTERS - 1972

Artistic creativity and computer technology are compatible. This was the essential experience of our collaboration with the computer. It began in 1972 with the arrangement of the underground passageway near the Belfort station: a study of the lighting, and mural decorations of a subway some 60 metres in length.

These dimensions in themselves exceeded the usual framework of artistic intervention (or collaboration) in public buildings. Thus was born the idea of associating with the Computing Department of the Institute of Technology, with research into plastic materials. Thanks to the competence of an E.E.I.P. engineer, J. B. Kempf, who is in charge of Mathematics and has recently turned computer specialist, we were able to accomplish this new task.

With a sense of wariness and caution, the group began the work it had conceived -- on a parallel with the computer and the drawing board. But this parallel work rapidly turned into a dialog.

THE NEED FOR ANALYSIS

It was our computer specialist who was the first to point out to the artists the necessity for previous, rigorous analysis of all the parameters which compose or make up the whole. These analytical proceedings of the computer specialist, when faced with a work of art which attempts to be a synthesis of art and science, may be paralyzing rather than inspiring.

Under one condition did collaboration between artists and computer experts become feasible: that is, by determining together the elements of the composition and by defining the assemblage of these parts which made up the whole. This formed the basis of many a long discussion, often illustrated by a sketch when ordinary speech proved insufficient, or when the discussions began to slip into aesthetic or philosophical speculations.

SUGGESTED SOLUTIONS TO THE SUBWAY MURALS

The installation of the lighting effects had to comply with two rules, the first objective, and the second, subjective:

1. The lighting system required sufficient abundance according to specified illumination standards dictated by the technical specialists, and also a progressive transition in the intensity of light toward the subject exits to avoid dazzle.

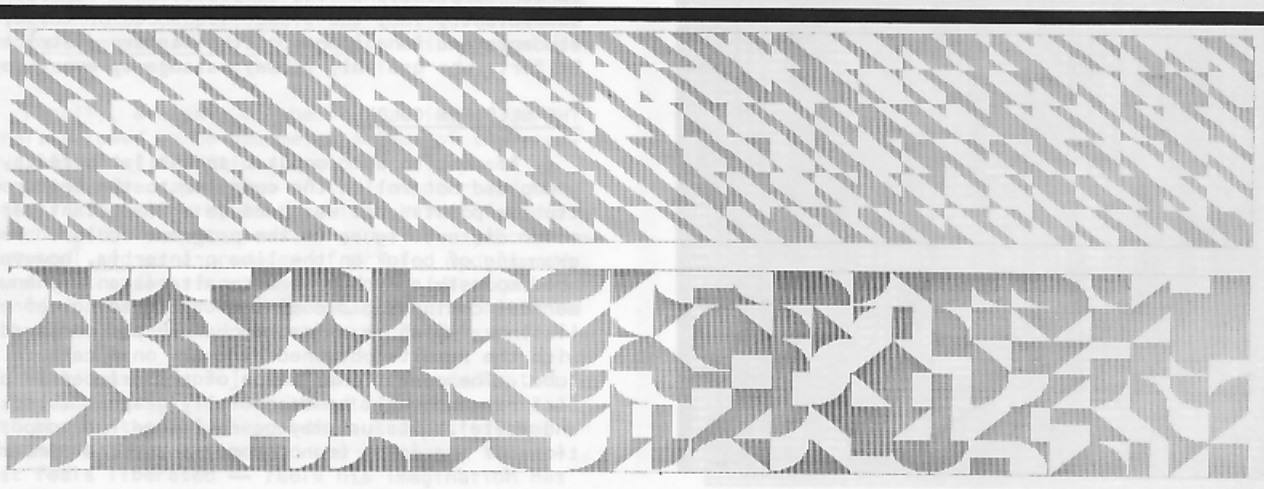
2. The sensation of the length in the corridor (60 metres) had to be reduced by dividing it into sections with vertically and evenly spaced neon tubes, thus reducing the space of the median zone, in order to create a sensation of acceleration.

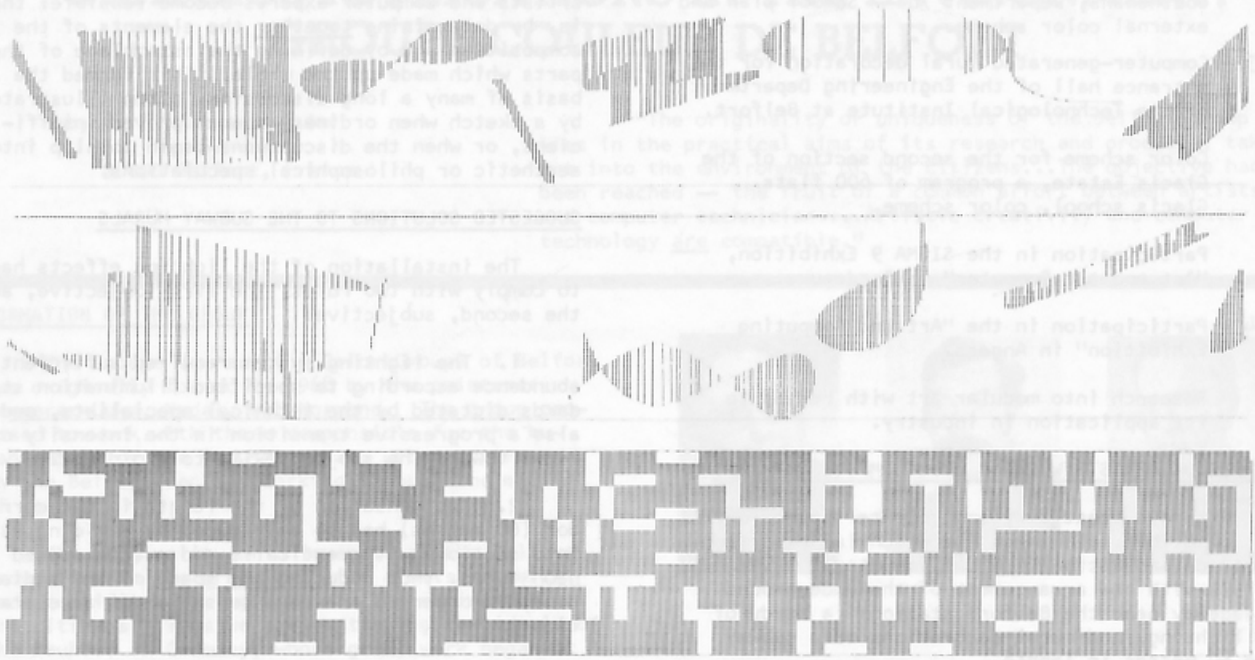
We asked our computer expert to do no more and no less than to incorporate "complexity of imagination", even "sensitivity" into the programs. The successful continuation of our work was to depend on the solution to this postulate.

But how are we to simulate the complex act of "imagination" by means of the computer? Any kind of simulation of creative art by rational methods forms a vicious circle, a crucial dilemma -- that is, to escape from the grip of mathematical laws by rational means -- and to attain art.

Yet from that moment onward, any possibility of achieving computer art will depend on the reconciliation of the real and the imaginary, of calculation and chance. Mathematical probabilists open up the way by using pseudo-hazardous series (pseudo-randomizations), that is, numbers by chance. From now on, these "numbers by chance" will play the role of "imagination", of artificial generators of complexity, whose volume will later need to be dominated and analyzed by the artists, according to the aesthetic objective that is envisaged. For 100% chance causes utter chaos, in our opinion, and is not always artistic.

BELOW: Further examples of studies for murals in ceramics, aluminum, etc. from printer output.



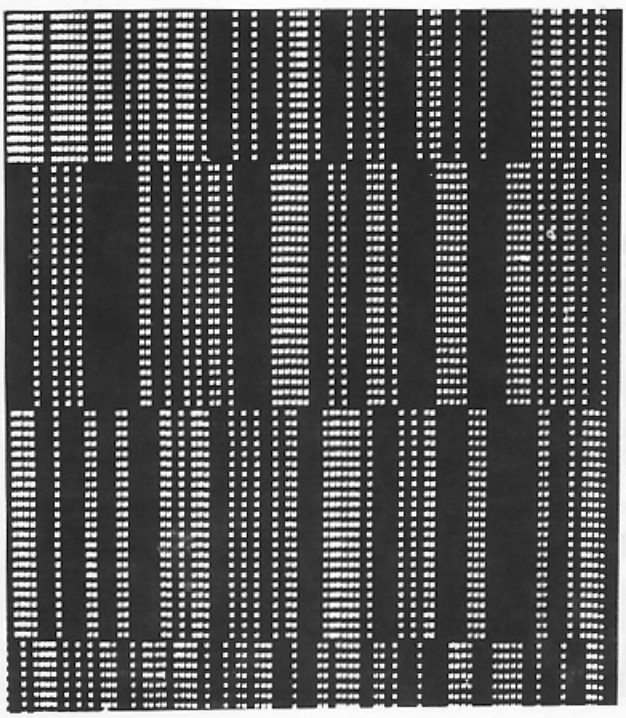


ABOVE: Fish-like forms vie with rectilinear patterns, but a few explored for monumental murals in the environment. The more abstract the patterns, the greater the number of potential variations.

PROGRAMMING AND PLANNING THE SUBWAY MURALS

As far as mural decorations were concerned, the components were simple: squares of Buchtal ceramic (30 X 30, 30 X 60, and 60 X 60 cm.), laid out in vertical strips of varying width. The entire efforts of the plastician were to depend on combinations of these elements.

BELOW: A sample of the vertical designs generated for the subway murals.



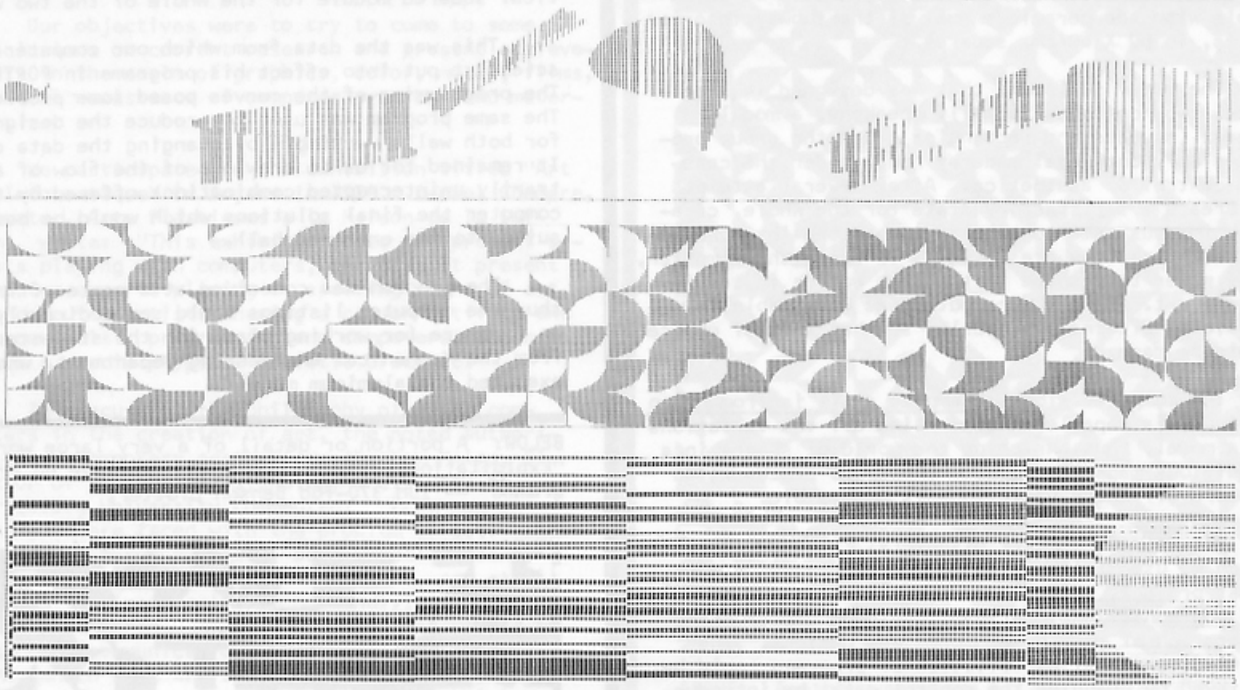
The first program used for introducing chance into the calculation of the disposition of the vertical strips produced a linear graph on the printer with a juxtaposition of patterns varying practically to infinity.

The computer scientist suggested a Fibonacci Series (of the $u_n - u_n - 1 = u_n - 2$... type), to be generated by the computer in systematic application. Alas, such slow completion of the program tried the patience of the group, so that they attempted other solutions -- but all planned solutions were conceived in a mathematical series. This was the first effect of rational computer methods on the work of the Belfort group.

Even if at first we let ourselves be carried away by the plastic imitation of a simple mathematical formula, this could not be said to be the case for the mural decorations. In fact, the problem was to find a true plastic (art) quality in these metres in question, to find a "living rhythm" thanks to the larger complexity in the composition -- in order to sufficiently vary the visual sequences of the 2,000 students and inhabitants of the Western districts of Belfort, who use this subway passageway every day.

THE NEED FOR COLOR

If despite our computer specialist's feats, the group did not follow the computer to the letter or "to the points", it was because an important parameter did not figure in the program: color. Programming of color on the line printer is, however, not impossible -- but it necessitates an alphanumerical coding and decoding of the readings of the listings, which is a fastidious process compared with the results obtained directly on a cathode ray tube. The operational value of the printer in plastics research will be essentially graphic (black and white). Its use may be envisaged for compositions of one color (monochrome) for for a number of



ABOVE: Further examples of the innumerable permutations of form from which the artist may choose. It is our hope to make a television film of the permutations, to more fully reveal the family of forms achieved.

reduced colors (contrasting polychromy).

RESULTS

It was a complete success: for on the line printer appeared, without the slightest discontinuation (paper skip) or repetition, the most varied and unexpected propositions, of which the few illustrations given here can give but a poor idea of the possibilities of the program, and the beauty of the results obtained.

The objective had been reached — the fruit of a common effort between artists and computer technicians. To sum up this experiment, working with the computer is slower initially in the program-writing stage, but more efficient than the traditional methods of conceptualization of the work by hand. The superiority of using the computer is that practically unlimited numbers of scanning sketches of the artistic problem can be quickly achieved. Thus the definitive choice of the work to be done may be effected after consideration of the immense sampling via computer, which opens up the way to greater aesthetic quality.

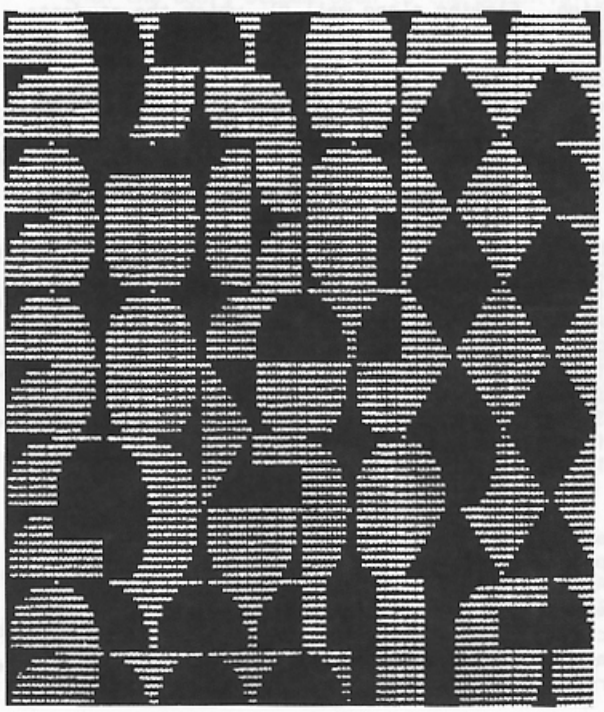
Finally, analysis of the realization of our murals allowed us to become conscious of the creative limits of traditional methods as opposed to the productive capacities of the computer and the artist. Thenceforth, in the elaboration of modular sketches, the computer was to serve us as a combination tool and as a producer of printed models. We found that endless new research paths were to be opened up to our group from this creative alliance with the computer and computer specialists.

What does the project of the mural decoration of the subway station owe then to the computer? With the contact of the prodigious capacities of combinations visualized and the listings, the artist feels liberated — feels his imagination has been unleashed, and pushed to a higher degree of originality.

MURAL SCULPTURE IN SHEET METAL - SUBWAY EXTERIOR

In addition to the underground murals for the Belfort subway, the western exit or exterior of the under-rail passage was to be embellished by a high

BELOW, RIGHT: Detail of a larger design for murals. Imagine these (and the others) in monumental sizes.



relief mural whose surface quality should be compatible with the ceramic enamel of the subway interior walls, in 60 X 60 cm. squares.

The mural sculpture that was designed in sheet-steel took on then, formally speaking, a modular aspect (squares and rectangles), and the group produced only one model made by hand, under the careful control of aesthetics. After several attempts to create a satisfactory state for the whole, creative impetus came to a halt. Since the interchangeable combinations are infinite in using the computer, they never take shape in the same way as in traditional art. Here the computer was invaluable in providing alternative models, so that a final choice could be made.

The computer alone, exempted as it is from human fatigue, is capable of generating all the variations of a model, thus enriching the world of shapes in a prodigious manner. To use manual art processes to explore all these variations is impossible.

Yet we made another discovery: the programs which we used (with definite aims in mind for our first project, the ceramic murals) to make vertical and horizontal explorations, could be used for the generation of many other forms and designs. The multi-dimensional exploitation of programs could be achieved by changing the control data, by introducing variants of all types, by modifying the modules and the ranges of contrast, and by acting on probabilities and chance.

We are at the source of the world of forms.

COMPUTER-GENERATED MODULAR DECORATION - 1973

The opportunity for further research presented itself in 1973. The Technological Institute of Belfort had the previous year held its first exhibition of computerized art. We were invited to decorate two walls of the entrance hall of the Mechanical Engineering Department, a surface area of about 50 square metres.

For the two walls in the Mechanical Engineering Department, we desired two differing forms of design. Flowing along wall #1, which the students pass by every day, thus blending in with the daily movement in the entrance wall we chose these modules: the circle being the organic form par excellence, was to furnish us with the modules for this wall (quarters of circles inscribed in a modular square with positive and negative areas, making 8 modules in all).

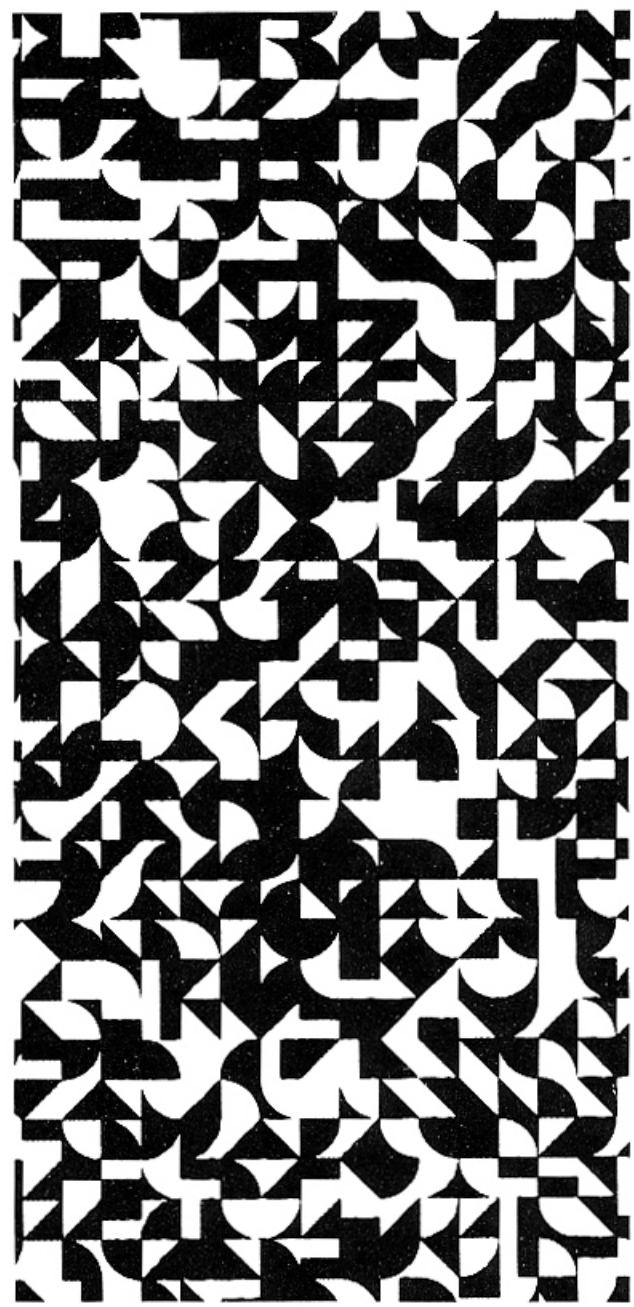
We asked our computer expert for the equiprobable occurrence of each module, in order to obtain a high degree of animation by variety and complexity. The dimensioning was calculated in accordance with the cross-ruling of the ceiling, and superimposed in six rows, also to integrate the decoration to a maximum effect with the architectural environment. After that came the choice of the material. Since we were working with the Mechanical Engineering Department, sheet aluminum was chosen for its low cost.

On the opposite side, however, on wall #2, is a static structured composition, which should appeal more strongly to a technician's imagination. As for wall #2, the same procedure was followed, except that the modules were drawn out of the circle by cutting the latter in two directions (at 45° and 90°). We obtained ten or so figures: squares, rectangles, triangles, all inscribed with an identical squared module for the whole of the two walls.

This was the data from which our computer scientist put into effect his programs in FORTRAN. The programming of the curves posed some problems. The same program was used to produce the designs for both walls — simply by changing the data cards. It remained for us to draw out of the flow of arbitrarily uninterrupted combinations offered by the computer the final solutions which would be best suited to the entrance hall.

The program was conceived at a scale of 1/10, thus the computer listings could serve directly as an exposure (or working plan) for the students from the Mechanical Engineering Department, who executed the aluminum murals.

BELOW: A portion or detail of a very large work, "Exploitation Quantitative et Qualitative du Programme" — IBM 370-168 Benson plotter.



EXHIBITIONS BY THE GROUP, 1974 - 1976

Our objectives were to try to come to some conclusions on current research and present achievements in the realm of graphics, color, music, films, with the assistance of computer programs and material.

We participated in the exhibition titled "Art et Informatique" in Angers in 1974. Daniel Chompre, Animator, Arts Plastiques a la Maison de la Culture, wrote: "This exhibition does not present artists playing with computers, nor does it present computer experts playing at creating works of art, but computer artists sharing a common activity and common tools: programming and computers, which finds a special type of artistic practice."

In discussing the philosophy of using computers in the creation of art, the noted authority on contemporary aesthetics, Abraham Moles, Director of the Social Psychology Institute, of Strasbourg University commented: "From now onwards, we are faced with the problem of establishing an art form on a total social scale, rather than on an individual scale. However, art still remains the 'message' from one individual, the artist, to another. Thus we need another method of aesthetic communication. Will machines and their work, which some artists have unconsciously advanced, be able to respond to this new social and artistic dimension?"

In 1976 the group participated in the Exposition au Centre d'Art et de Recherche Plastique Architecturale in Paris.

SUMMARY

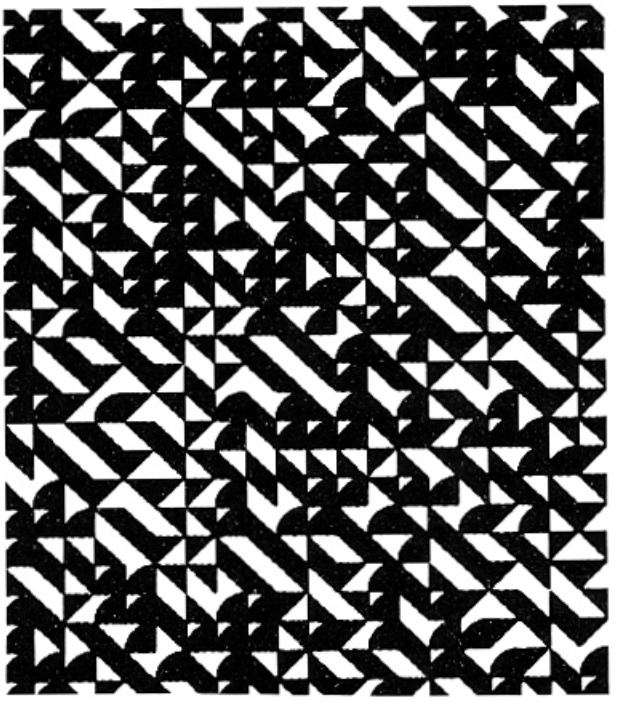
We may ask, "Why this profusion of forms, this vast complex of computer-generated works?" This leads us to one or two fundamental reflections on the role which computer art will be called on to play in our industrial civilization, the latter way of life having barely begun for the majority of humanity.

With the increased use of computer-generated art, the popularity (or desire for) computer art will proliferate every form of art, including the decorative arts. Due to the densification of housing around places of work, a growing need for quality plastics will make itself felt in our artificial environment. The computer alone will be able to supply to our satisfaction, both quantitatively and qualitatively, original works of art which thus will humanize our community life at the close of the 20th century.

But it is essential for the artist to dominate (or control) the relationship between order and disorder, logic and chance, the dialog between form and anti-form, all of which vivify a work of art. In short, to orchestrate a whole by starting from a few basic elements, as in musical composition. It is to this end that we are urged by computer art, which may become a powerful tool in the hands of artists.

That is why architects and men in industry should begin to investigate computer art. At that moment, and only then, will we abandon the purely repetitive, impersonal principle present in the building industry.

By programming computer art as soon as it is conceived, the latter will be able to make an entry into the assembly lines, since it speaks in the same language -- molds for preassembled concrete, and for plastic plating or tiling to correspond to the computer's design moldules -- authentic, infinitely variable decorative panels will be produced with the help of numerical control.



ABOVE: Another variation of the "Exploitation Quantitative et Qualitative du Programme" -- a detail of a much larger work.

This imagination offered by the computer will enter into the industrial manufacturing processes of tomorrow. But when shall we see the wallpaper industry, the decorative fabrics industries, the clothing, weaving and tapestry industries opening their drawing offices and their workshops to the computer?

When the doors become open to the potential of the computer, we will realize at last the dream of design, the industrial aesthetics proclaimed by the great plasticians at the beginning of this century in the Bauhaus, by Le Corbusier in France, and by so many other great artists. This will involve adapting art to technological civilization and its computer-oriented manufacturing processes which animates for us the world of forms hitherto manual and primitive.

Computer art permits the effective participation of its users at many levels of choice without any loss in quality but implies the condition that users may screen the results obtained to correspond in an optimized manner to the aesthetic criteria established in advance. This is a step towards democratization of quality art in the realm of mural decoration which died out with the craftsmen of the nineteenth century.

In summary, the computer offers to us the possibility of recreating a plastic vocabulary and system according to the needs and means of modern production, without sustaining a loss in the quality of art. We will then experience a renewal of decorative art, which will become, by virtue of its universality, a new world form of popular art.