



下村千早
Chihaya Shimomura

RCM Galerie

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4 June - 31 July 2026

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Chihaya Shimomura, works 1961–1978

In 1973, Chihaya Shimomura placed a sheet of transparent acetate ruled into a grid over a black-and-white photograph of Walter Gropius reproduced in Hans Wingler's **Das Bauhaus**, the standard German-language history of the school. He read off the tonal value of each cell of the grid with his eye, wrote down the number, and continued, cell by cell, until the portrait existed on paper as a column of digits. The numbers were keyed onto punched cards. The cards were carried to the Tokyo University Computation Centre and fed into a HITAC mainframe, where Shimomura ran the data through a chain of FORTRAN subroutines he had written. The output was a tractor-fed line-printer sheet bearing the printed header TRANSFORMED OR DEFORMED PICTURE. Sheets from this run are in the exhibition, shown for the first time outside Japan.

The same hand had been at this kind of work for twelve years already. In his apartment in Hongo, at twenty, Shimomura had been making geometric abstractions in pen and china ink on card. The instrument changed; the operation did not. Between 1961 and 1978 he worked on a single problem, in three media, with steadily increasing technical means. The exhibition shows the spine of that practice: the hand-drawn studies of 1961 and 1962, the line-printer portraits of 1973, and the geometric series of 1978 generated through his own programming language.

Shimomura was born in Hiroshima in 1941 and moved to Tokyo to study art. By 1961 he was living in Hongo and enrolled at the College of Art of Nihon University, which he would complete in 1963 with a degree in fine arts. From there he went to the Tokyo University of the Arts, Geidai, the country's senior fine-art institution, and took a master's degree in 1965.

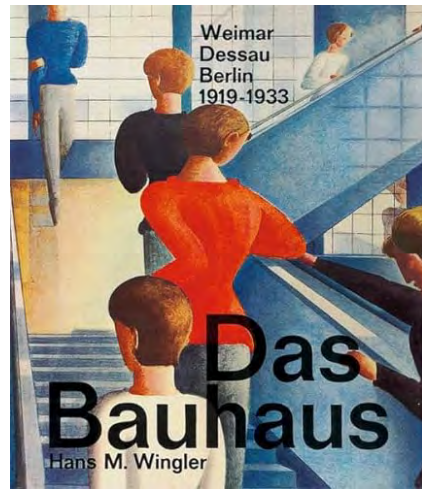
Iwao Yamawaki, who founded the Design Department of the College of Art and taught there as professor from 1947, had studied at the Bauhaus Dessau between 1930 and 1932. He had photographed in the workshop of Walter Peterhans and returned to Tokyo in 1932 with the Bauhaus pedagogy intact. He carried it forward through a teaching career that ran for more than four decades. What Shimomura received from him, in his own description, was Bauhaus-system design education, taught at first hand. The pedagogy treated a picture as a set of modules and operations rather than as an image, and the training shaped what Shimomura made next.

At some point in this period, Shimomura assembled a set of slides of his drawings and sent them to Albers in New Haven. Albers wrote back, and sent works of his own in return.

The drawings Shimomura made in those years, between 1961 and 1962, were never publicly exhibited. He did not show them to Hiroshi Kawano, with whom he was already studying. They were a private practice carried on in parallel with his formal studies. He stopped drawing by hand once he began to work with computers, and he never returned to the medium. The drawings in this exhibition are therefore a closed and finite body of work, shown for the first time in 2026.



*Shimomura took a photo of Gropius from Das Bauhaus
Two photos from the Computer Art exhibition in 1970
of Shimomura and Kawano in Tokyo in 1970*



The work itself is geometric abstraction in pen and china ink on card. Shimomura knew the work of Victor Vasarely. He has stated, in answer to a question prepared for this catalogue, that he was particularly influenced by a specific student exercise reproduced in Wingler's *Das Bauhaus*. The drawings are in that lineage. A field of radiating lozenges interferes with itself in calibrated symmetry. A quincunx of dotted nodes pulses with the optical pressure of a Vasarely Vega. Grids of modular squares are laid down and then progressively warped, the deformation reading as a single rule applied across the surface. The technical control is high. The compositional thinking is structural. There was no plotter available to Shimomura in Tokyo in 1961; the drawings nonetheless look like plotter output, and they look like plotter output half a decade before plotter art existed in any developed form. A grid is laid down, a rule is applied to it, and the surface of the picture is the result. Considered as a procedure, this is a picture transformation system. Twelve years would pass before he built one in software.

These are not student exercises. Shimomura was working alone in Tokyo, with an awareness of Vasarely and a correspondence with Albers but no direct contact with the European geometric movements then forming in Paris, Padua, Milan and Düsseldorf. He has said that he did not know Bridget Riley's work, nor that of Gruppo N or Gruppo T, both founded in 1959. Op art as a Western category did not yet have a name; *The Responsive Eye* at the Museum of Modern Art, which would coin one for it, was four years away. From within that comparative isolation, with pen and ink on card, he made drawings of a quality and an inventiveness that stand alongside anything being made in Paris or Düsseldorf at the same date. What is harder to find in the European record of 1961 is the systems-thinking that runs through them — the picture taken not as image but as the result of a rule applied to a substrate. Sol LeWitt's first wall drawings would not appear until 1968. What Shimomura was doing in his apartment in Hongo did not yet have a recognised peer.

The Kawano Years

While at Nihon University, Shimomura attended the lectures of Hiroshi Kawano, an information-theory philosopher then teaching at the Tokyo Metropolitan College of Aeronautical Engineering who had introduced Max Bense's information aesthetics to Japan. The course was, as Shimomura has described it, the first information-aesthetics lectures in Japan.

The relationship soon extended beyond the lecture hall. In 1963, Kawano carried out a Markov-chain experiment in which 123 student subjects placed three motifs — a blue square, a red circle, a yellow-green triangle — across a nine-cell picture grid. Kawano's published account of the experiment, in the *Bulletin of the Tokyo Metropolitan College of Aeronautical Engineering* in 1964, names Shimomura as one of the four Nihon University fine-arts students who collected the data, performed the statistical analysis on paper, and produced the work.

He worked alongside Kawano for the next seven years. When Kawano put the K-system on the OKITAC 5090A at the Tokyo University Computation Centre in 1964, with the breakthrough paper following in January 1965, Shimomura was at the realisation. When the two of them mounted the Computer Art Exhibition at the Plaza DIC in Nihonbashi in October 1970 — the first full public presentation of the K-system — Kawano developed the overall concept and wrote the texts; Shimomura designed the exhibition and the explanatory panels. The published apparatus of the show, in the twelve-page spread in *Graphic Design* No. 41 (Kodansha, March 1971), bears Shimomura's hand throughout. The isometric K-system diagrams in the spread are his drawings, rendering Kawano's framework into a form the public could read. The final page carries Shimomura's own essay, *Possibility of Computer Graphic Design*.

The DIC exhibition closed on 14 October 1970. Kawano's seminars ended that year. Shimomura took up a full-time lectureship at Musashino Art University, and he has described what followed in plain terms: his interests shifted toward his own research and toward teaching programming to his students. Kawano he has called both teacher and mentor. He began to work alone.

Gropius, 1973

By 1973 Shimomura had built his own system. He documented it in an article in the Research Bulletin of Musashino Art University. The system was a library of forty named subroutines on a HITAC mainframe at the Tokyo University Computation Centre, organised in functional groups, callable as a chain from a FORTRAN main programme. Each subroutine performed one transformation. OUTLIN drew a contour. HICONT produced a high-contrast separation. TONE3A reduced a picture to three tones. SCREW rotated. FROTAG produced a grain effect. SINCUR ran the picture through a sinusoid. A short FORTRAN main programme would read in a digitised image, apply subroutines in sequence, and overstrike characters on a line printer to produce a tonal output.

Shimomura ran the system on a portrait photograph of Walter Gropius reproduced in Wingler's Das Bauhaus. The bibliography of the 1973 paper places the procedure inside a wider intellectual frame, with citations spanning cybernetics, information aesthetics, semiotics, and generative grammar.

Getting the photograph of Gropius into the computer in 1973 was not trivial. There was no scanner available to him. He laid a sheet of transparent acetate ruled into a grid over the page of Wingler, read off the tonal value of each cell with his eye, and transcribed the values into a column of digits which were then keyed onto punched cards. The hand that had made the drawings of 1961 and 1962 was now reading a Bauhaus portrait into a column of numbers, point by point.

The works themselves are the outputs of those operations. The line-printer sheets mention their own metadata in the upper margin: the date, a run number, a system identifier, and, in capitals, SIMOMURA. The header DIGITAL PICTURE identifies, by Shimomura's account, a single pass of the unmodified data through the printer. The header TRANSFORMED OR DEFORMED PICTURE identifies an output produced by multiple passes through the subroutine chain. Several of the works are accompanied, in the same continuous-feed roll, by the FORTRAN listing of the programme that produced them. By Shimomura's account, the listings are documentation rather than part of the work.

The Gropius portraits were not exhibited at the time. They were not published in journals. They appeared only in the Musashino research bulletins of 1973 and 1978. They have never been seen outside Japan. This exhibition is their Western debut.

Musashino, 1978

By 1978 Shimomura was a senior figure at Musashino Art University (MAU), teaching in the Department of Industrial Design — soon to be renamed Visual Communication Design — on the path that would lead to a full professorship in 1984. He had set the portraits aside. The lead article of the university's Research Bulletin No. 10 returned him to the territory of the 1961 drawings, abstract and geometric, but with an instrument by then more capable than the FORTRAN library of 1973.

The instrument was called PLPT, the Programming Language for Picture Transformation. PTS, the underlying system, was a library callable only by someone fluent in FORTRAN. PLPT was the layer above. It was a small language with its own grammar, implemented in PL/I, with macro commands that mirrored the way a designer thinks rather than the way a compiler does. SEE-SOURCE-DATE read in an image. OUTLINE drew a contour. TOPOLOGIC-AL-DEFORM warped the picture along a topological deformation. COMPUTER-MONTAGE composited multiple sources. IRREGULAR-UNIT-TO-PATTERN built a substrate from rectangles of random size. ROUND-AND-ROUND-EACH-UNIT rotated each sub-unit independently by a random angle. The user composed a programme by writing a few legible sentences. The system handled the rest.

The purpose was direct. PLPT was built so that, in Shimomura's words, designers and ordinary users unacquainted with the computer language could make pictures. PTS handled the underlying transformations. PLPT — its dictionary, its parser, its parameter-conversion module — sat between those transformations and the designer, who composed images by writing instructions in something close to ordinary English, with brackets for picture attributes and an extensible vocabulary that could be enlarged by adding entries to a dictionary table without modifying the underlying code. He had built an authoring system for a discipline that did not yet have one.

The 1978 paper presented architecture and theory; the command manual was deferred to the following year's bulletin. Twenty-three plates accompanied the text, numbered 作品 1 through 作品 23, and read in sequence they form a single sustained study in transformation. 作品 1 is the seed: a five-by-five grid of nested square units in shifting tones, generated by the command CHANGING-TONE-MAKES-PATTERN. Everything else descends from it. 作品 2 is the same image rendered through OUTLINE, returning the field to line. 作品 3 is 作品 2 deformed along diagonals through DIAGONAL-DEFORM. 作品 4 is 作品 1 with each sub-unit rotated by random angle. 作品 5 is 作品 4 outlined in turn. The works branch and inherit through twenty-three steps; by the end the original five-by-five lattice is no longer recoverable without the working. 作品 19 opens a different generative branch, IRREGULAR-UNIT-TO-PATTERN, which builds the substrate from rectangles of random size. 作品 20 through 作品 23 then run the standard cycle on that irregular substrate, producing a final family structurally distinct from the first eighteen.

The visual character of the works is determined as much by the output device as by the algorithm. Shimomura worked on two. The line printer produced images by overstriking characters at varying densities to build a ten-step greyscale. The Printronix, a dot-matrix machine he describes in the paper as new, represented tone in dots of 0.4 millimetres scanned at 800 bits per line. The line-printer outputs have the dense, granular, character-marked surface that came to define what 1978 mainframe-art looked like. The Printronix outputs are smoother and more graduated. Both are present in this exhibition.

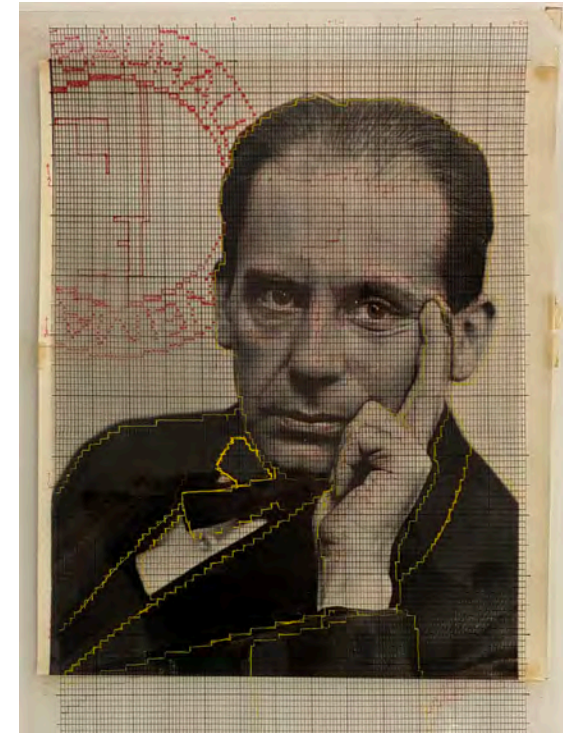
The 1978 works share with the 1961 drawings the proposition that what defines a picture is the operation that produced it. The warped grids of 1961 were the output of a deformation procedure applied by hand. The geometric works of 1978 are the same procedure made executable.

After 1978

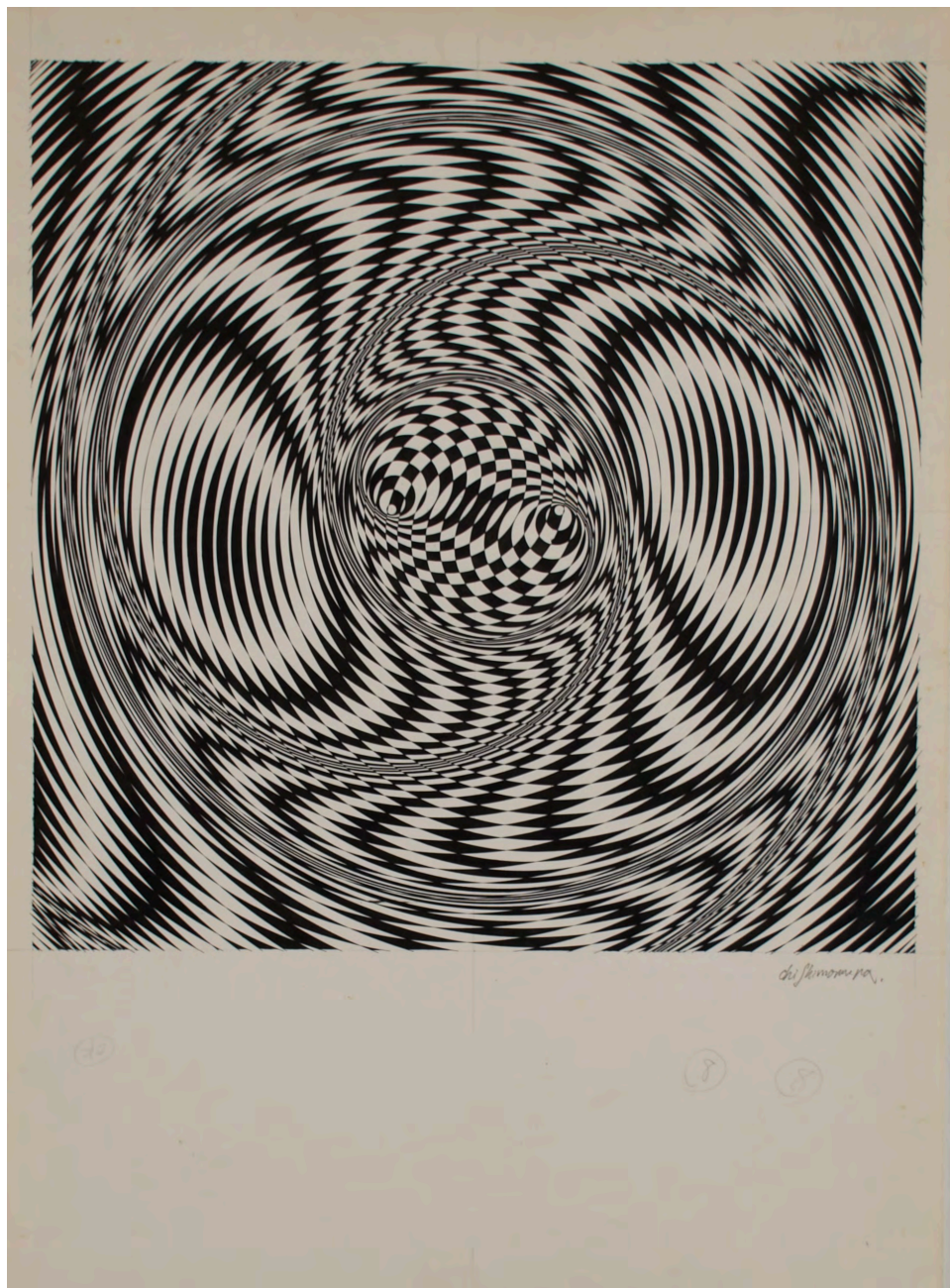
Shimomura continued to publish on the system through the 1980s, in the bulletin of the Japan Society of Science of Design and in further instalments in the Musashino Research Bulletin. He co-authored Lectures on Semiotics 3: Art as Sign, published by Keisō Shobō in 1982, and the Image Processing Handbook, published by Shōkōdō in 1987. From 1988 to 1989 he served as a visiting researcher at the National Aerospace Laboratory of the Science and Technology Agency. He became a full professor at MAU in 1984 and held the chair until his retirement in 2011. From 2003 to 2004 he was a visiting professor at the Rhode Island School of Design.

The international record was established early. He had read Herbert Franke's Computergraphik Computerkunst, the early German-language survey of computer art (Bruckmann, 1971), and wrote to Franke directly, sending a letter together with about thirty of his geometric works. Franke included him in the second, expanded edition of the book, published as Computer-Grafik: Bilder nach Programm — Kunst im elektronischen Zeitalter (DuMont, 1984), and again in the English edition Computer Graphics — Computer Art (Springer-Verlag, 1985). He served as exhibitor, juror and lecturer at the First International Computer Art Exhibition in Beijing in 1996. Simulated Color Mosaic, a 1970 collaboration with Hiroshi Kawano, entered the collection of the Musée d'art contemporain de Montréal. He organised the 2006 retrospective 20th Century Computer Art: Beginnings and Developments at the Tama Art University Museum, which placed Japanese pioneers — Kawano, Yoshiyuki Abe, the Computer Technique Group — alongside Nees, Nake, Mohr, Verostko and Molnár. His work was included in Ex Machina: Frühe Computergrafik bis 1979 at the Kunsthalle Bremen in 2007 and in the inaugural exhibition of the Hiroshi Kawano archive at ZKM Karlsruhe in 2011.

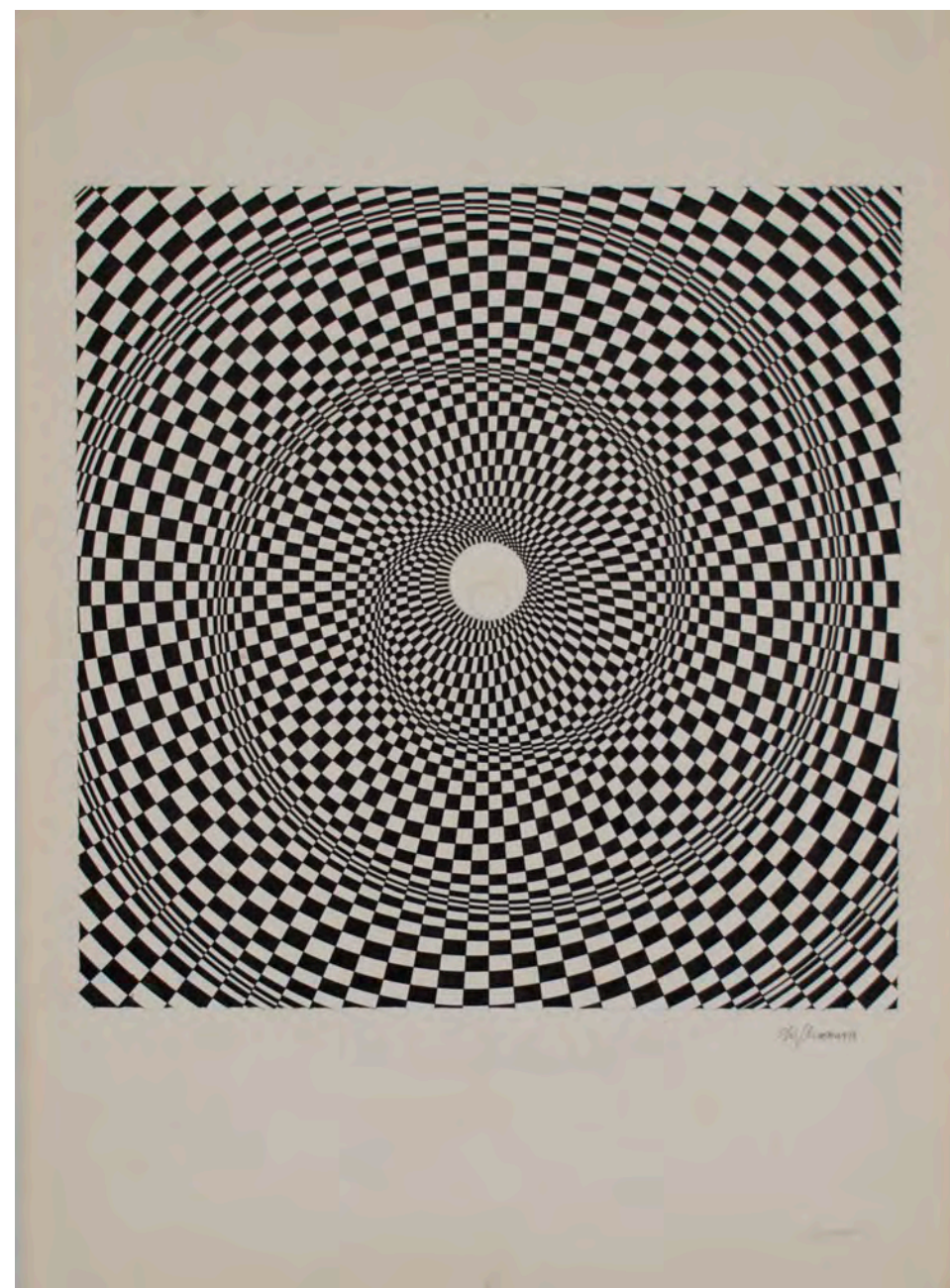
The body of work this exhibition presents — the 1961–62 drawings, the 1973 portraits, the 1978 geometric series — is the spine of that career, made when he was first formulating the operation that would define the rest of his practice. The hand-drawn deformation, the FORTRAN portrait and the PLPT lattice are stages of a single thought. They have not been shown together in this configuration before.



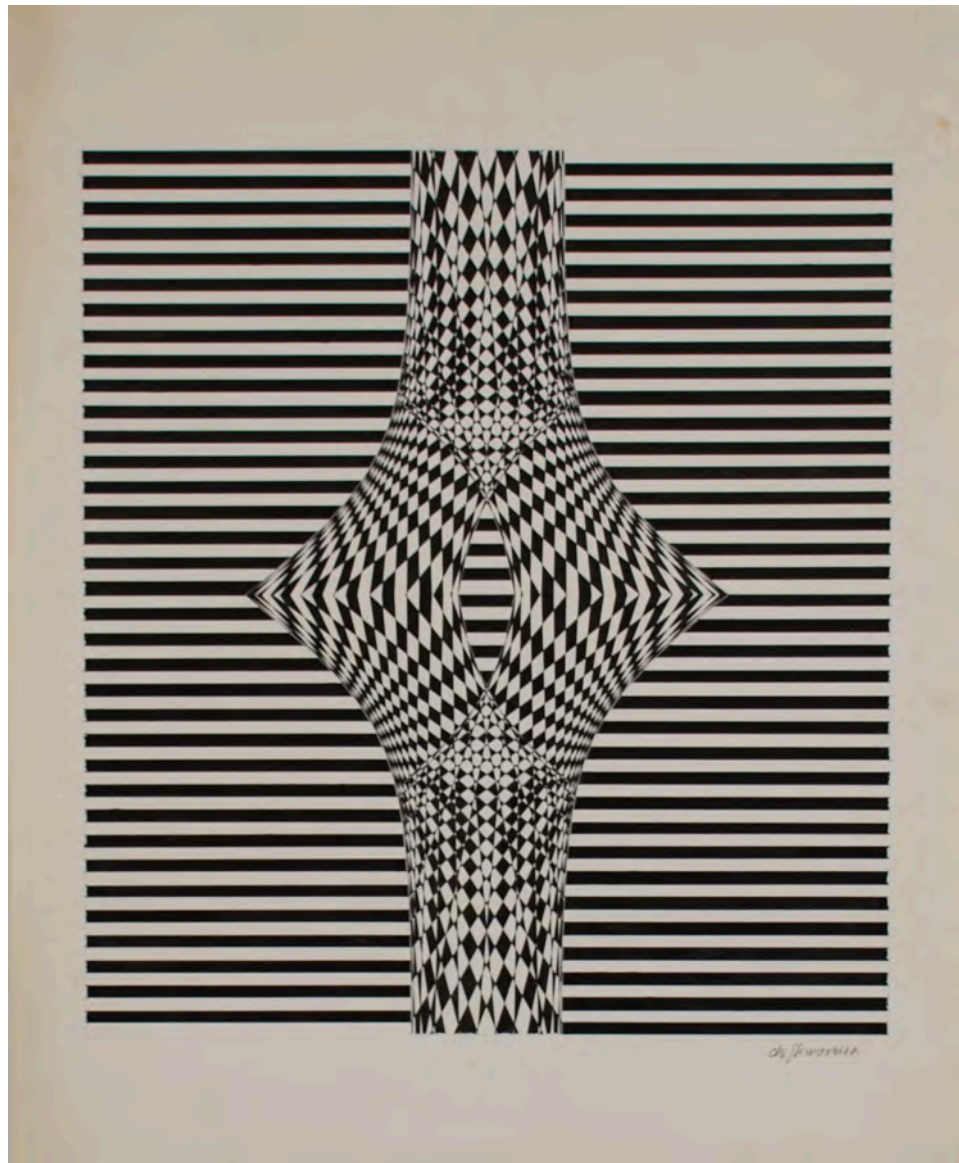
*The photo of Gropius from which Shimomura worked
A page from the publication in 1973 in which the artist
describes the process*



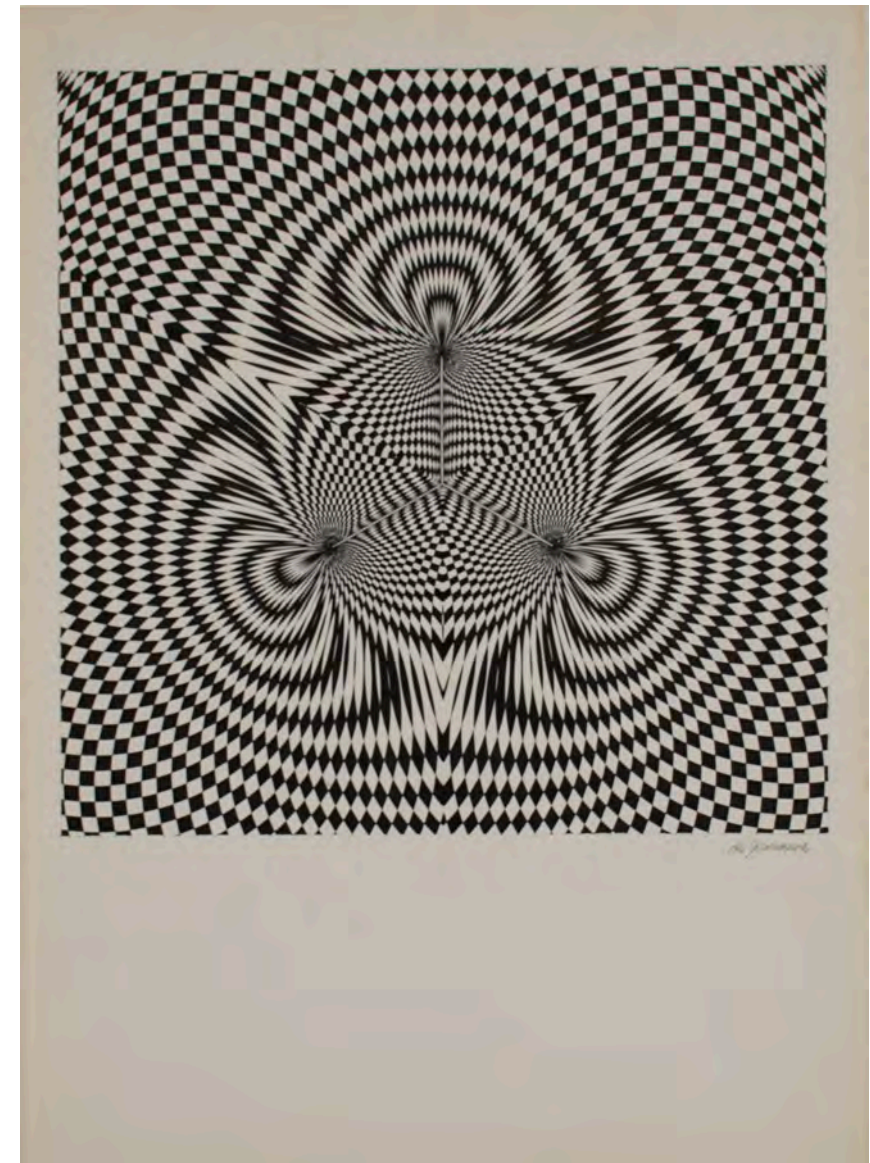
Untitled
1961
pen and china ink on card
55 x 39.5 cm



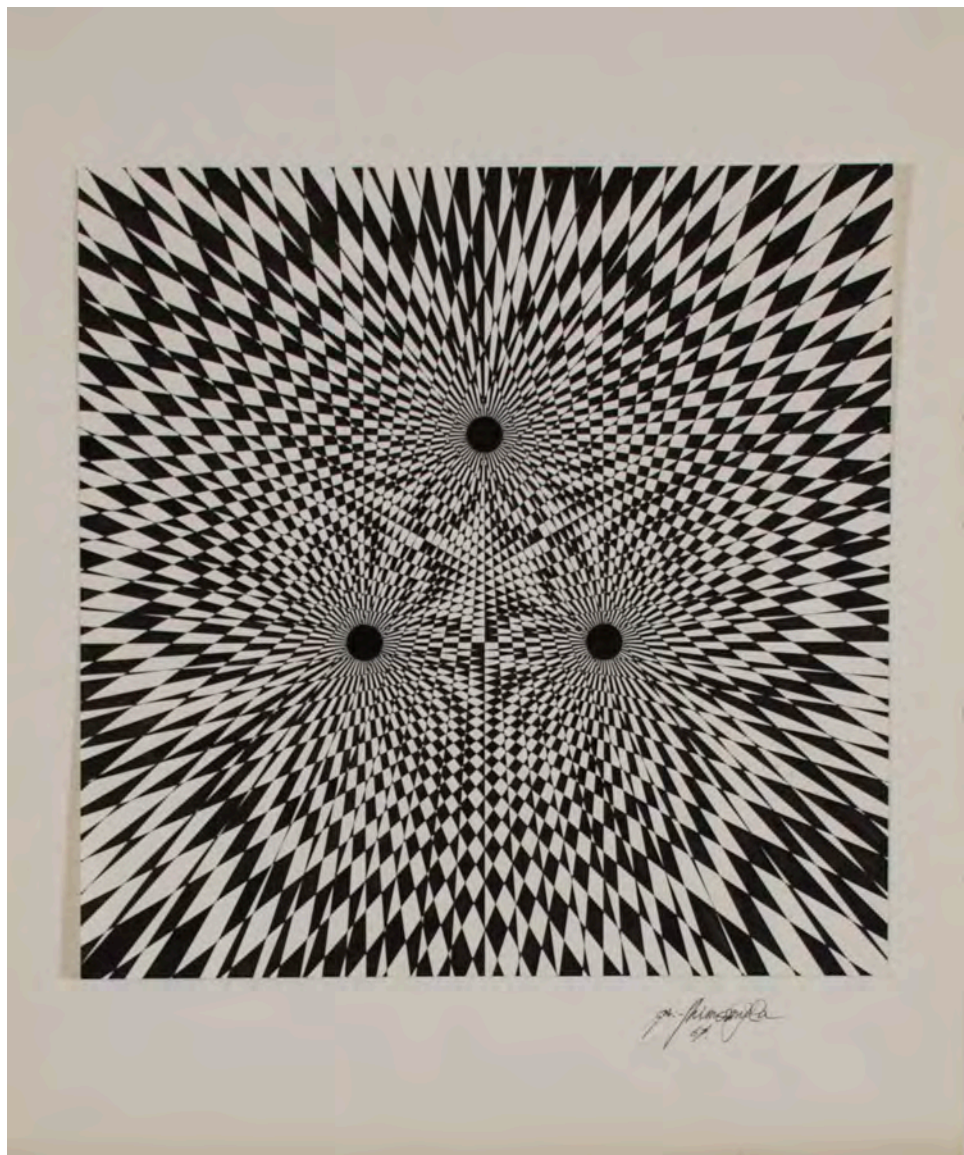
Untitled
1961
pen and china ink on card
54.5 x 39.5 cm



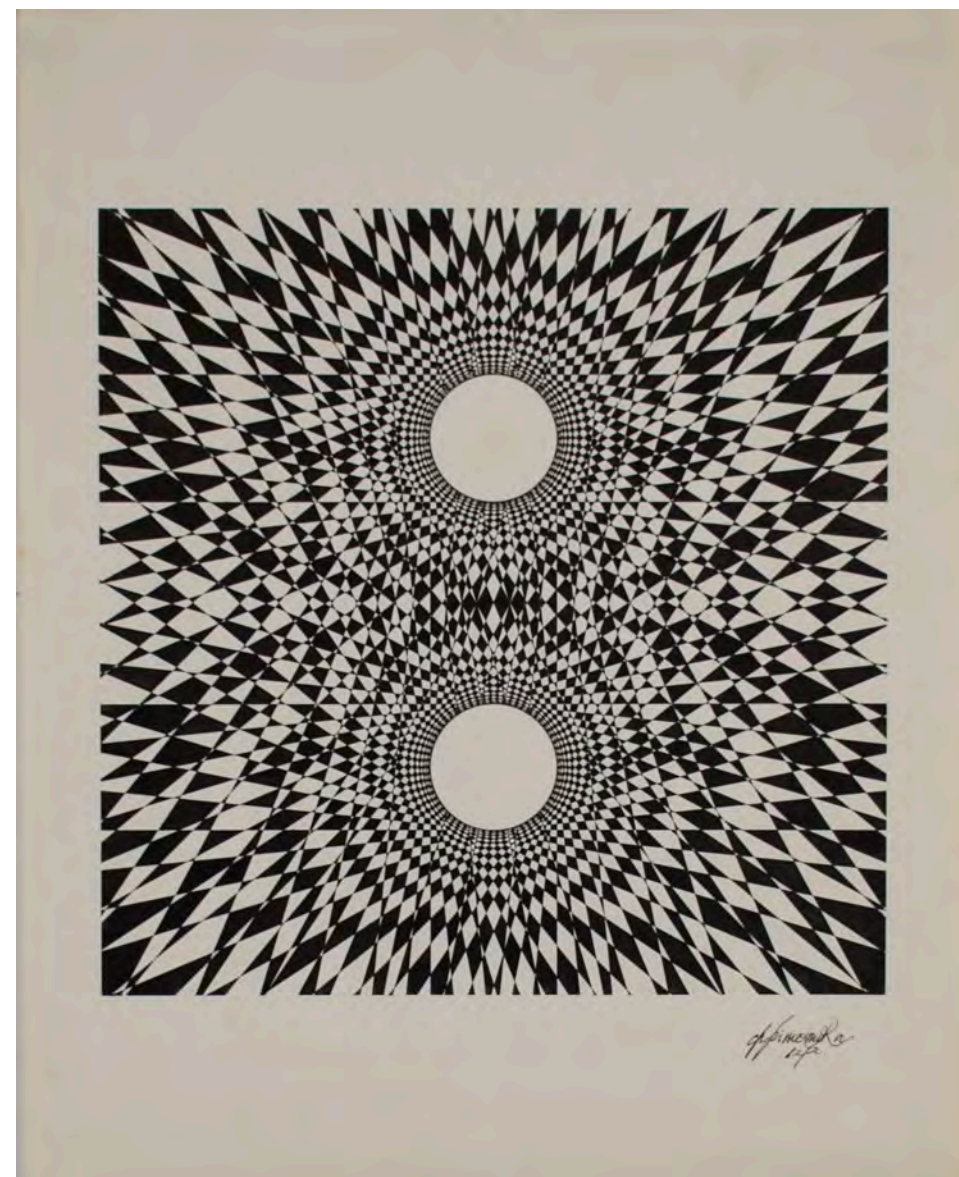
Untitled
1961
pen and china ink on card
47 x 38 cm



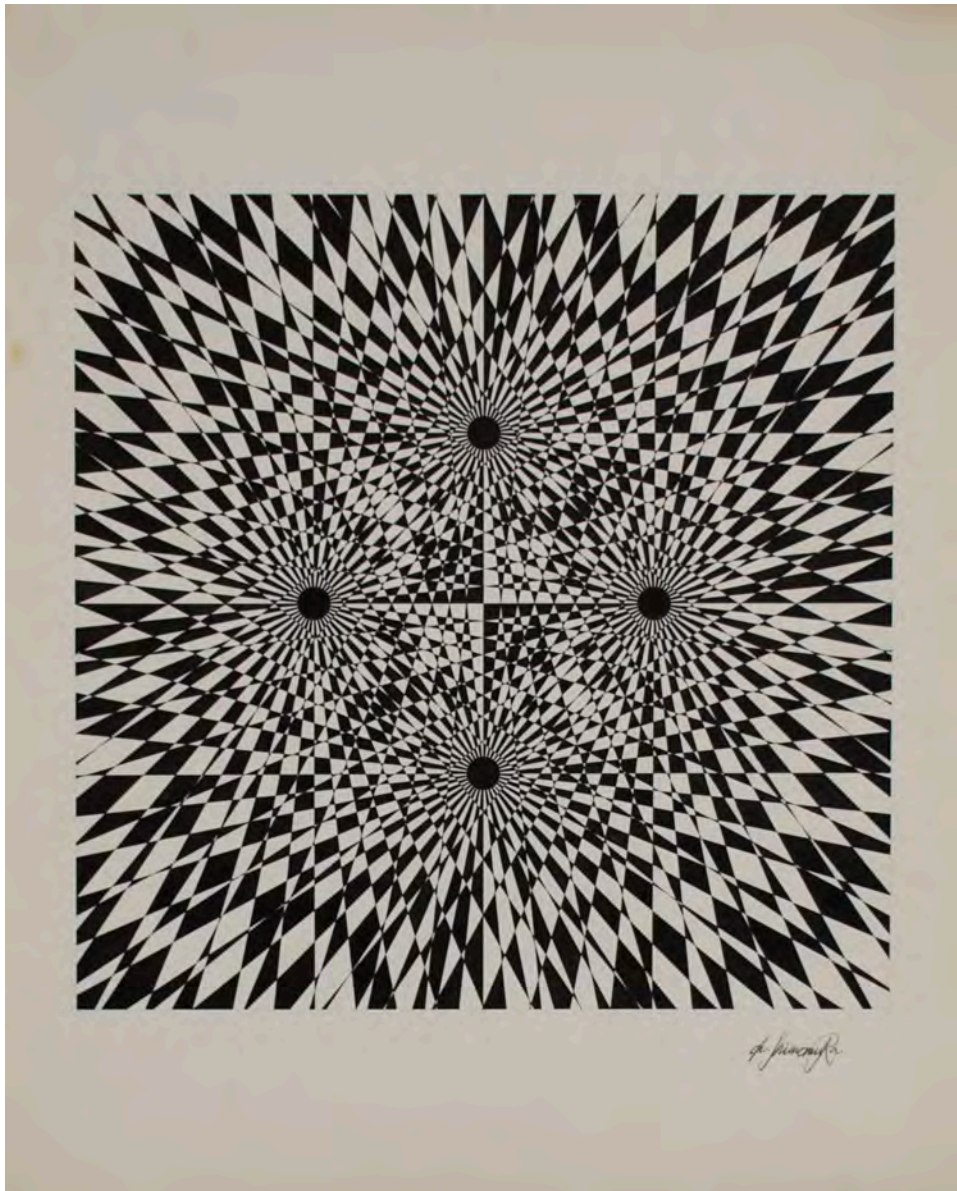
Untitled
1961
pen and china ink on card
55 x 39.5 cm



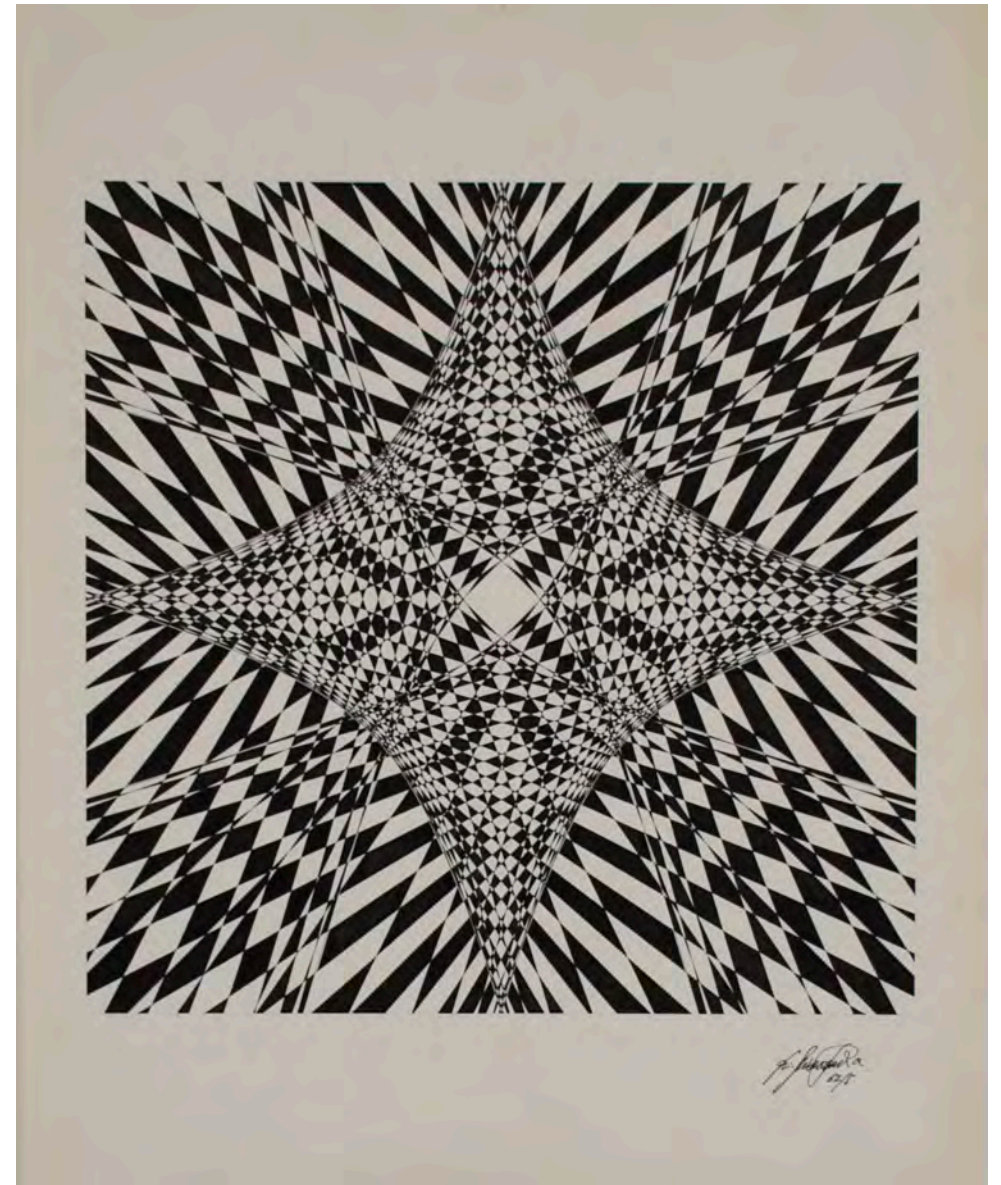
Untitled
1961
pen and china ink on card
47 x 38 cm



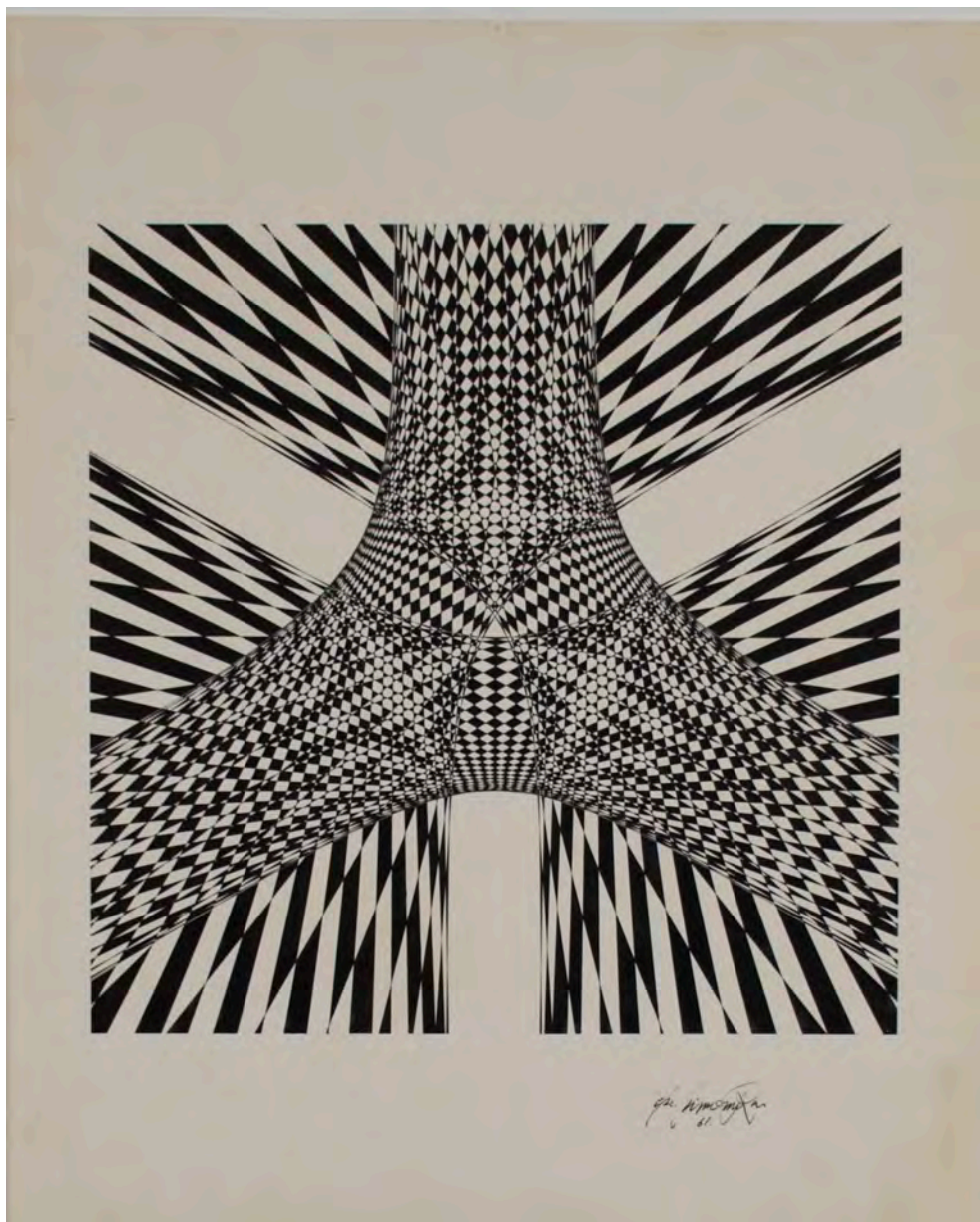
Untitled
1962
pen and china ink on card
47 x 38 cm



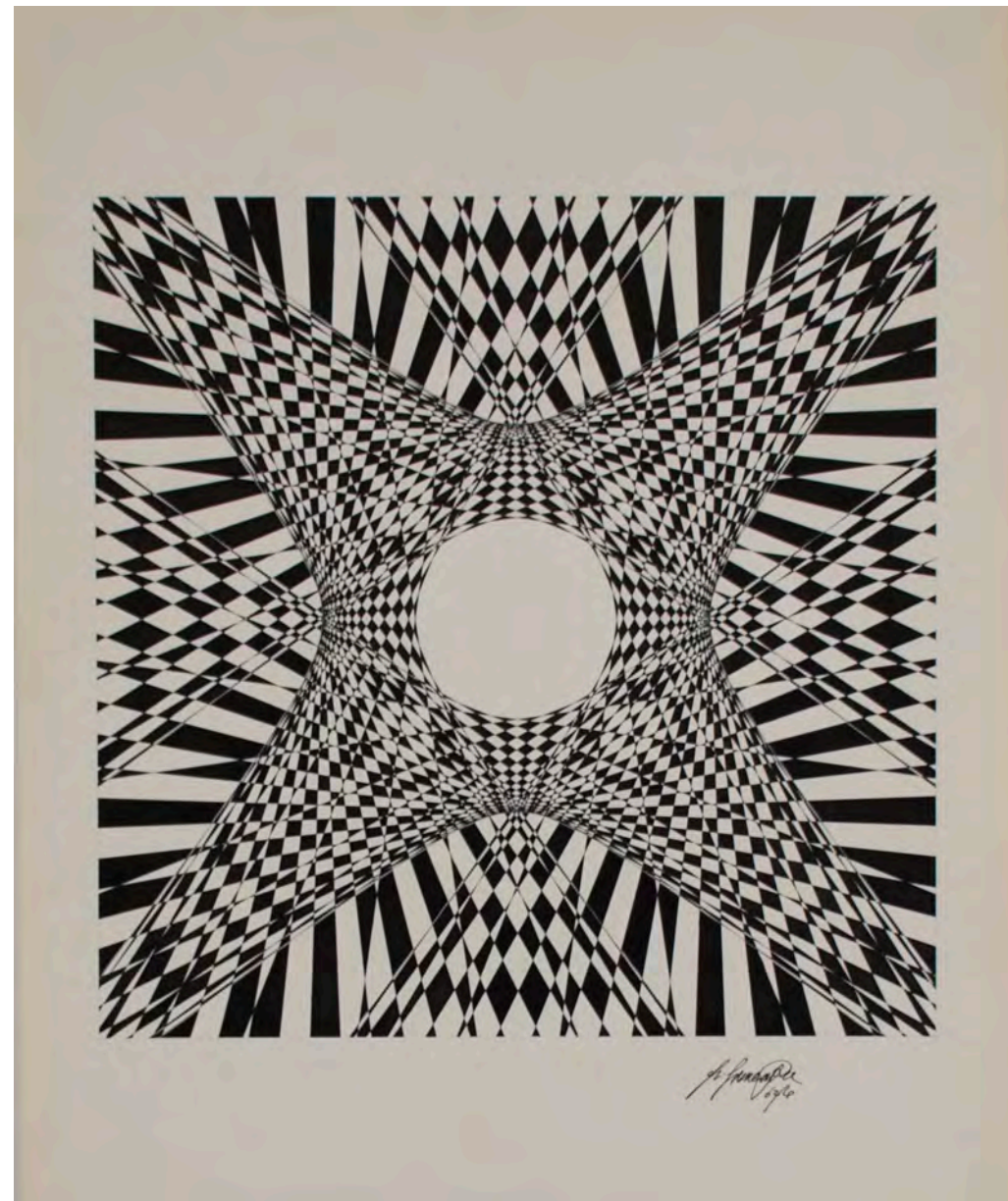
Untitled
1962
pen and china ink on card
47 x 38 cm



Untitled
1962
pen and china ink on card
47 x 38 cm



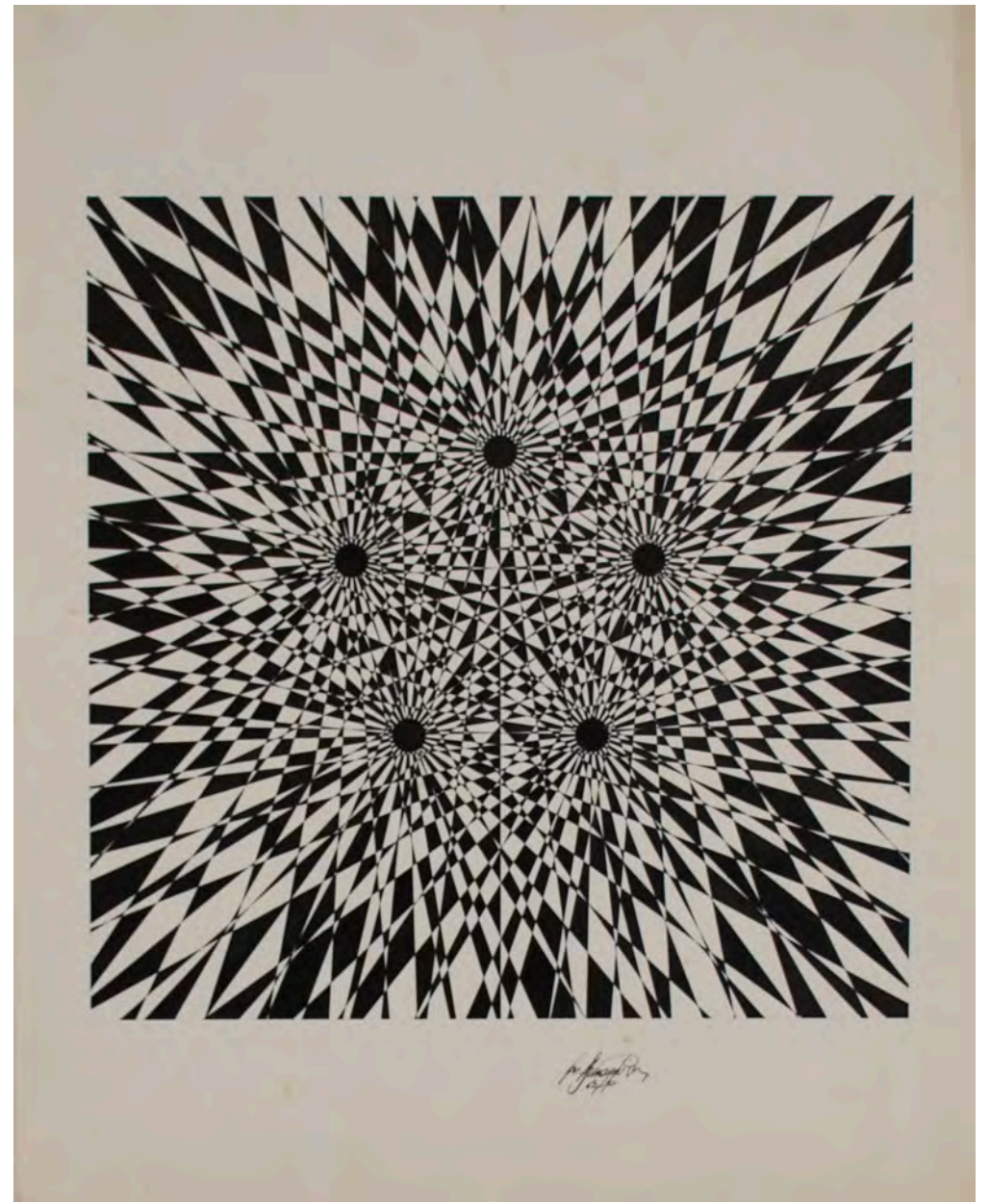
Untitled
1961
pen and china ink on card
47 x 38 cm



Untitled
1962
pen and china ink on card
47 x 38 cm



Untitled
1961
pen and china ink on card
47 x 38 cm



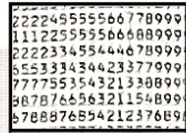
Untitled
1962
pen and china ink on card
47 x 38 cm

コンピュータによるイメージ生成プロセス

アナログ画像のデジタル化



元画像



デジタル(数値)化
画像の濃淡を数値データ
0~9に変換

デジタル画像



数値データ0~9までを、10階調に
多重ウチした印刷の濃淡画像に変換

画像イメージの計算
画像合成アルゴリズム抽出
PTS System

濃淡をつけた
再現画像



輪郭線抽出
勾配値3の輪郭
変数で輪郭線

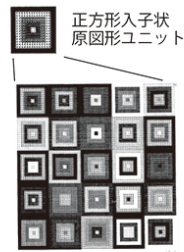


10階調の濃淡
画像を、使用
者の濃度値の
指定でn階調
の画像に変換。
例:濃度値を白
0-黒5-白
0-黒6.....
と縞文様のよ
うに分割した
等高線画像

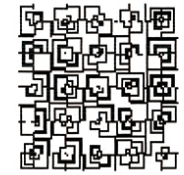


図形の記述実験
図形記述言語(PLPT)作成
PLPT System

入れ子の原図
形を、コマンド:
CHANGING-T
ONE-MAKES-
PATTERNで、
縦横5列の図
形を生成する



上の生成図の
各ユニットを4
分割して、コ
マンド:
ROUND-A-ND-
ROUND-EACH-
UNITを用いて
回転変換し、
さらにアウト
ライン変換し
た図形



上の生成図の
線と地に、乱
数でトーンを
再代入した図
形



< PLPT による図形生成の実験 >

説明図制作: 下村千早 & 西本企良

Translation key for diagram
Title: Computer-based image generation process
Column 1 —

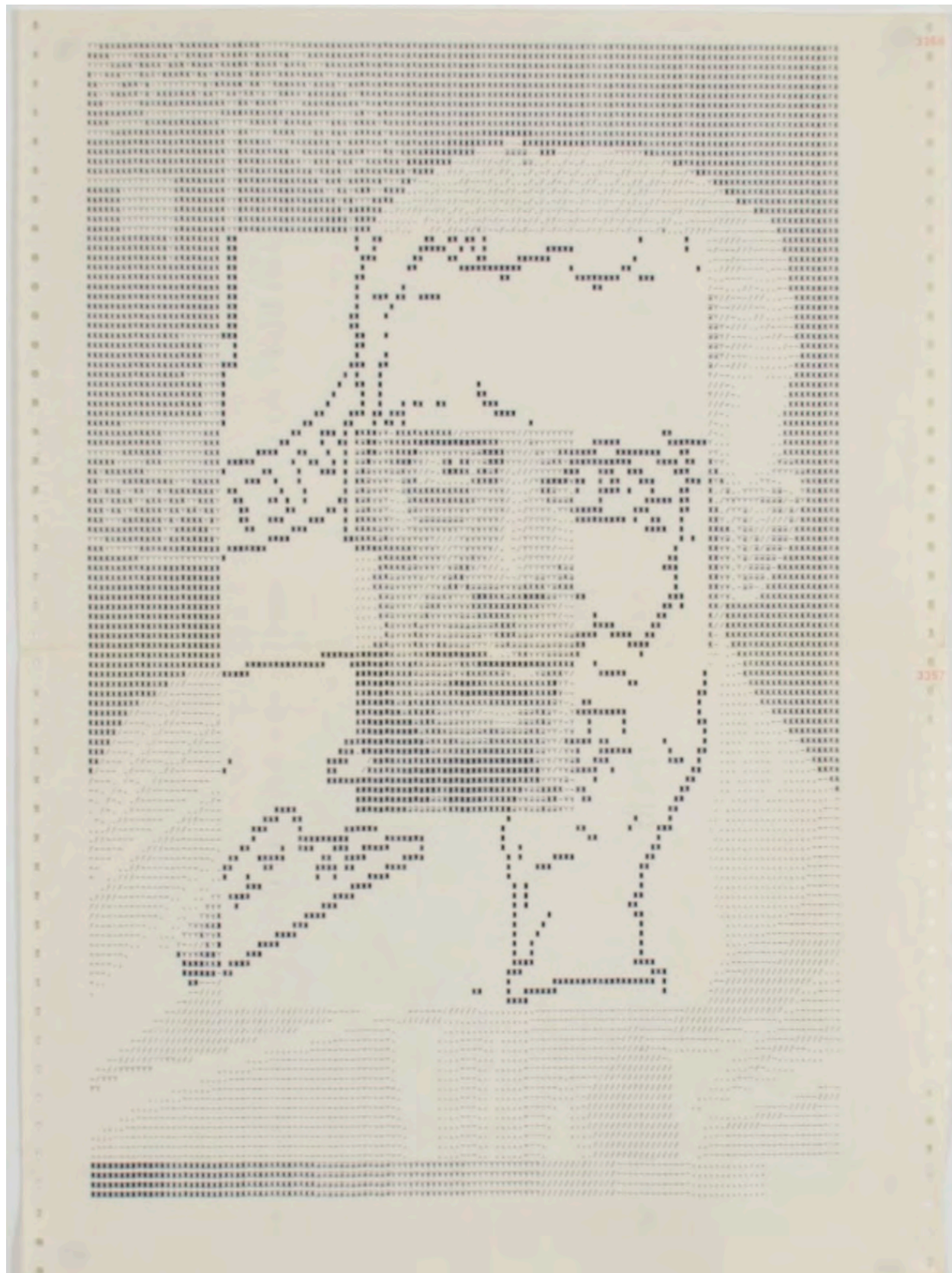
Digitisation of the analog image
Image label (below photograph of Gropius)
Original image
Caption (below numerical-data sheet)
Digitisation (numerical conversion). The tonal values of the image are converted to numerical data from 0 to 9.
Column 2 — Digital image
Caption (printer output)
Numerical data from 0 to 9, converted into a printed continuous-tone image using a ten-level multiple-overstrike line printer.
Column 3 — Computation of the picture image (PTS System)
Extraction of image-synthesis algorithms
Tonal reproduction image
Middle image caption
Outline extraction. Contour gradient value 3, outline produced with the outline variable.
Bottom image caption
A ten-tone continuous-tone image converted into an n-tone image according to user-specified density values. Example: a contour-line image divided in a stripe pattern as white 0 — black 5 — white 0 — black 6 — ...
Column 4 — Experimental description of figures (PLPT System)
Column heading (line 2)
Top image caption
A nested source figure is generated as a 5-by-5 array using the command CHANGING-TONE-MAKES-PATTERN.
Middle image caption
Each unit of the figure generated above is divided into four, then rotated and transformed using the command ROUND-A-ND-ROUND-EACH-UNIT, and further outline-transformed.
Bottom image caption
A figure produced by re-substituting tone values into the lines and ground of the figure above, using random numbers.
Footer (below bottom-right cluster)
Experiment in figure generation by PLPT
Credit (bottom right of diagram)
Explanatory diagrams produced by Chihaya Shimomura & Kira Nishimoto



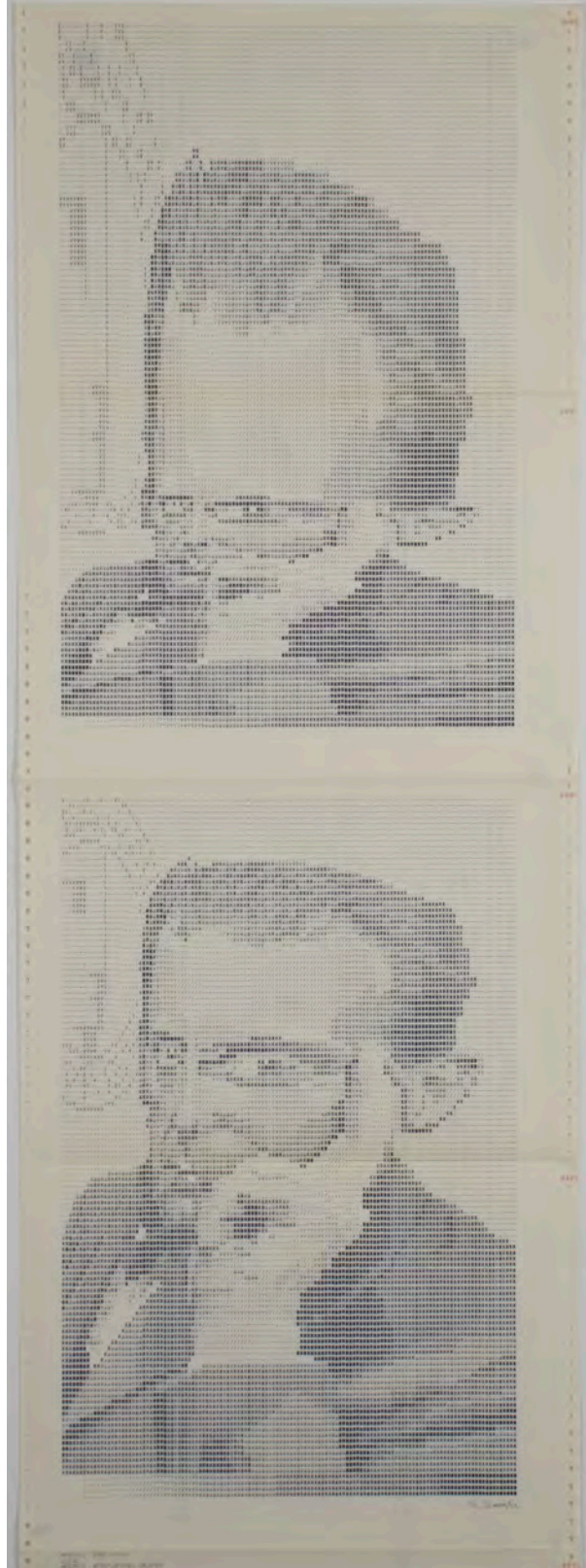
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



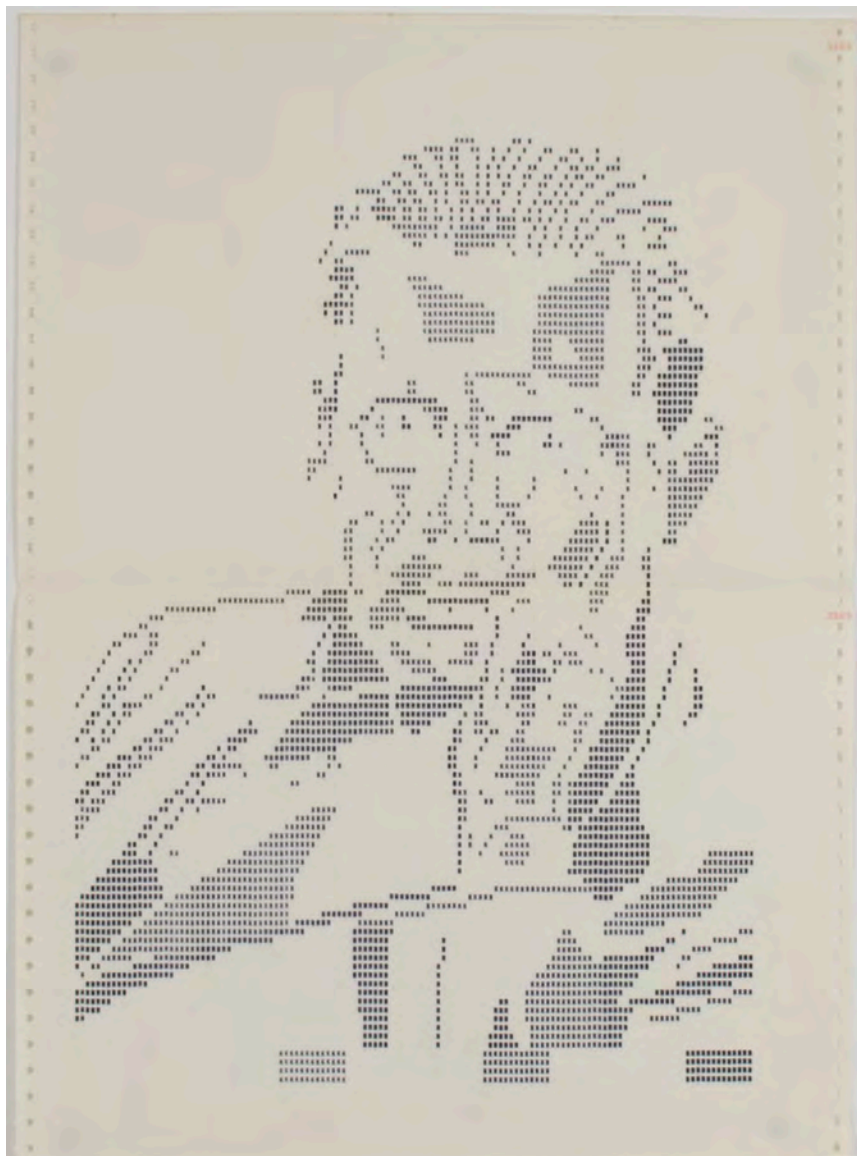
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed
original source code



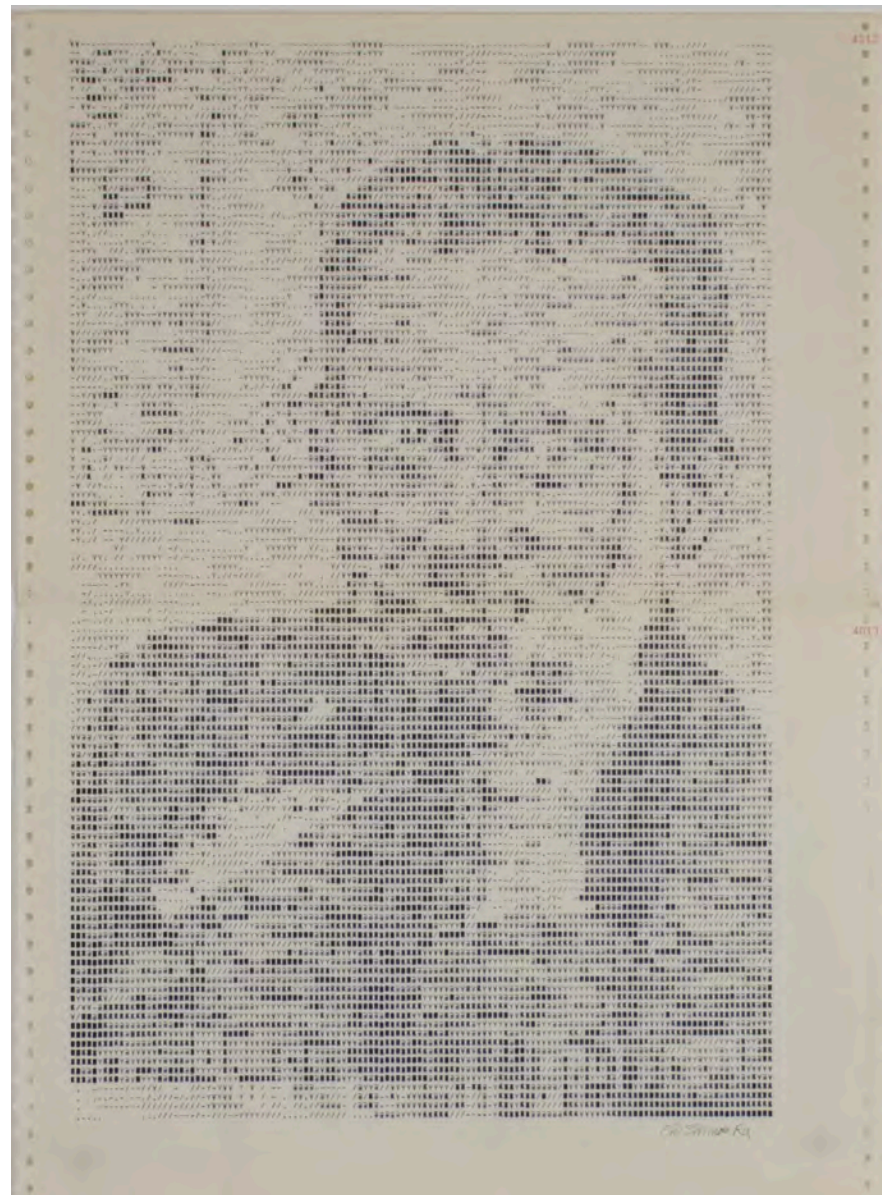
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
112 x 41 cm (image)
accompanied by multiple pages of printed original source code



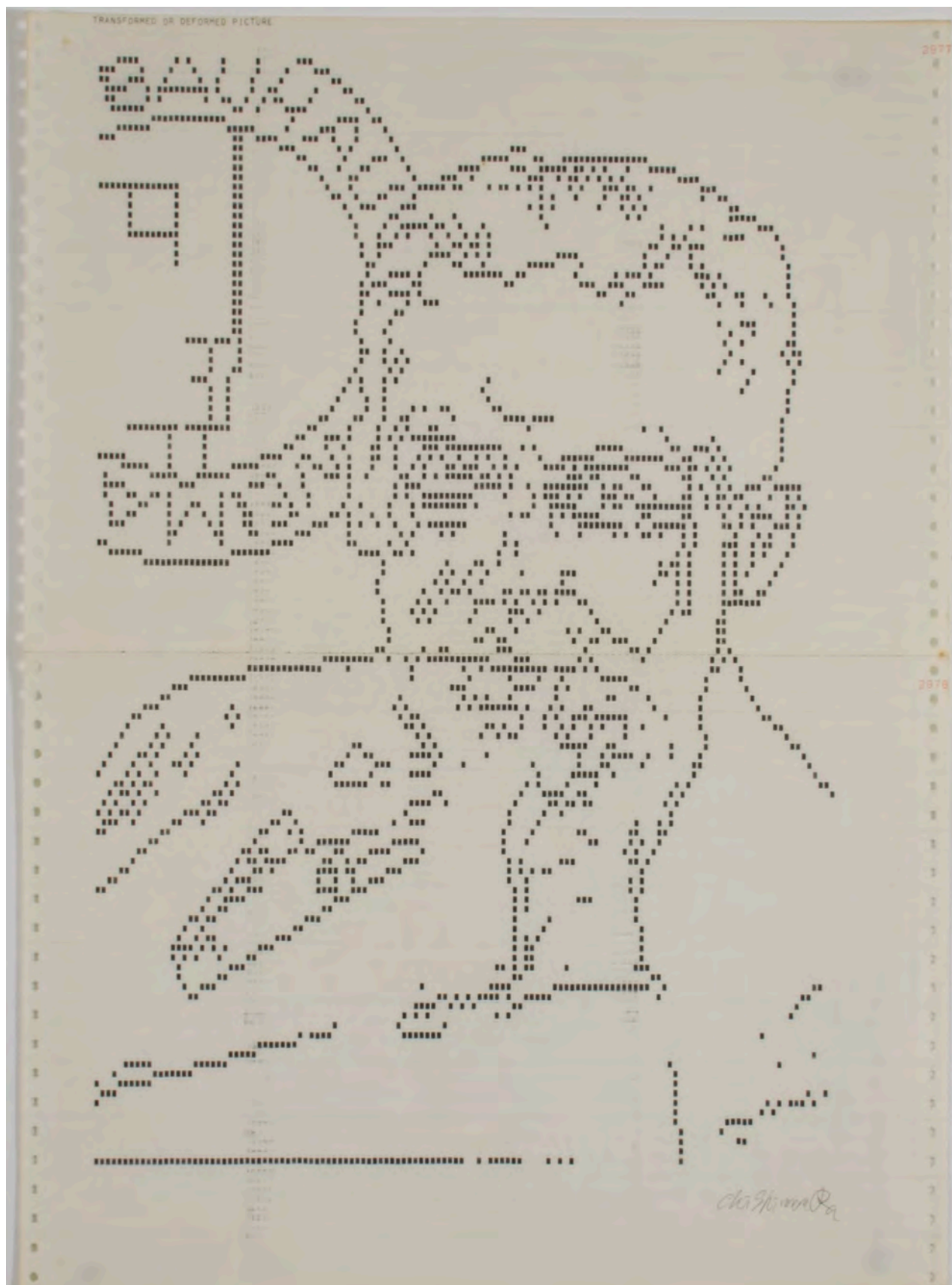
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
112 x 41 cm (image)
accompanied by multiple pages of printed original source code



Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



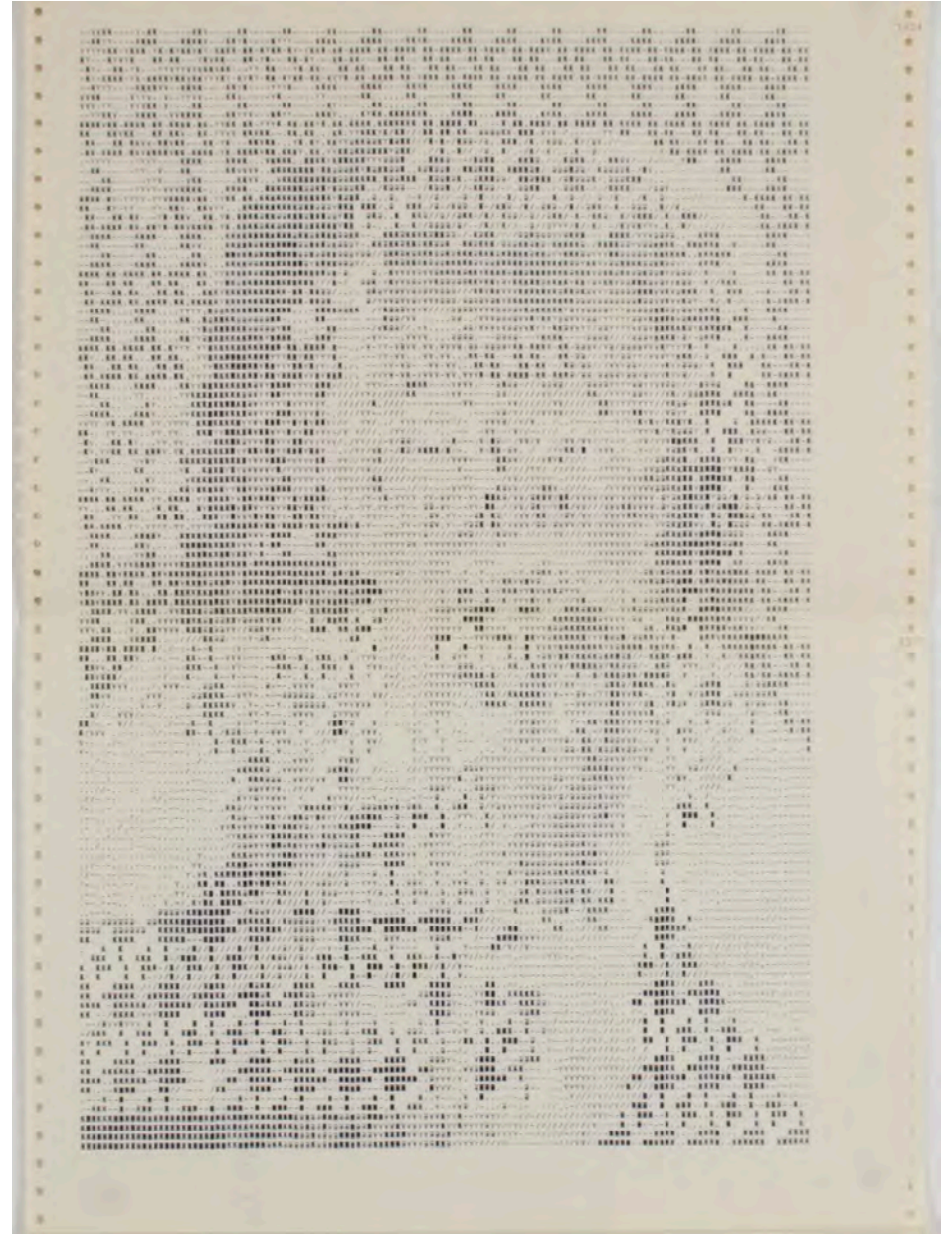
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



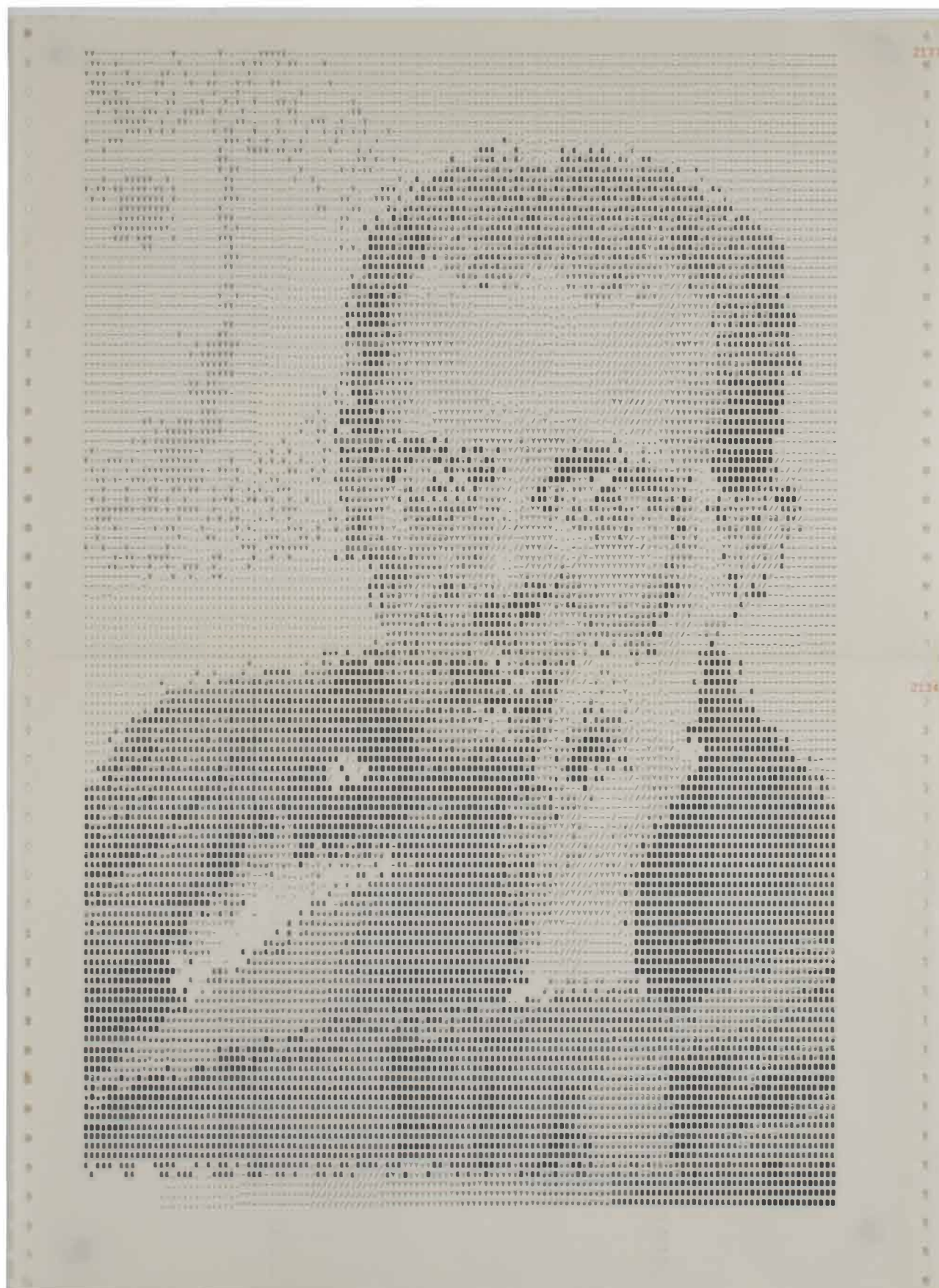
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed
original source code



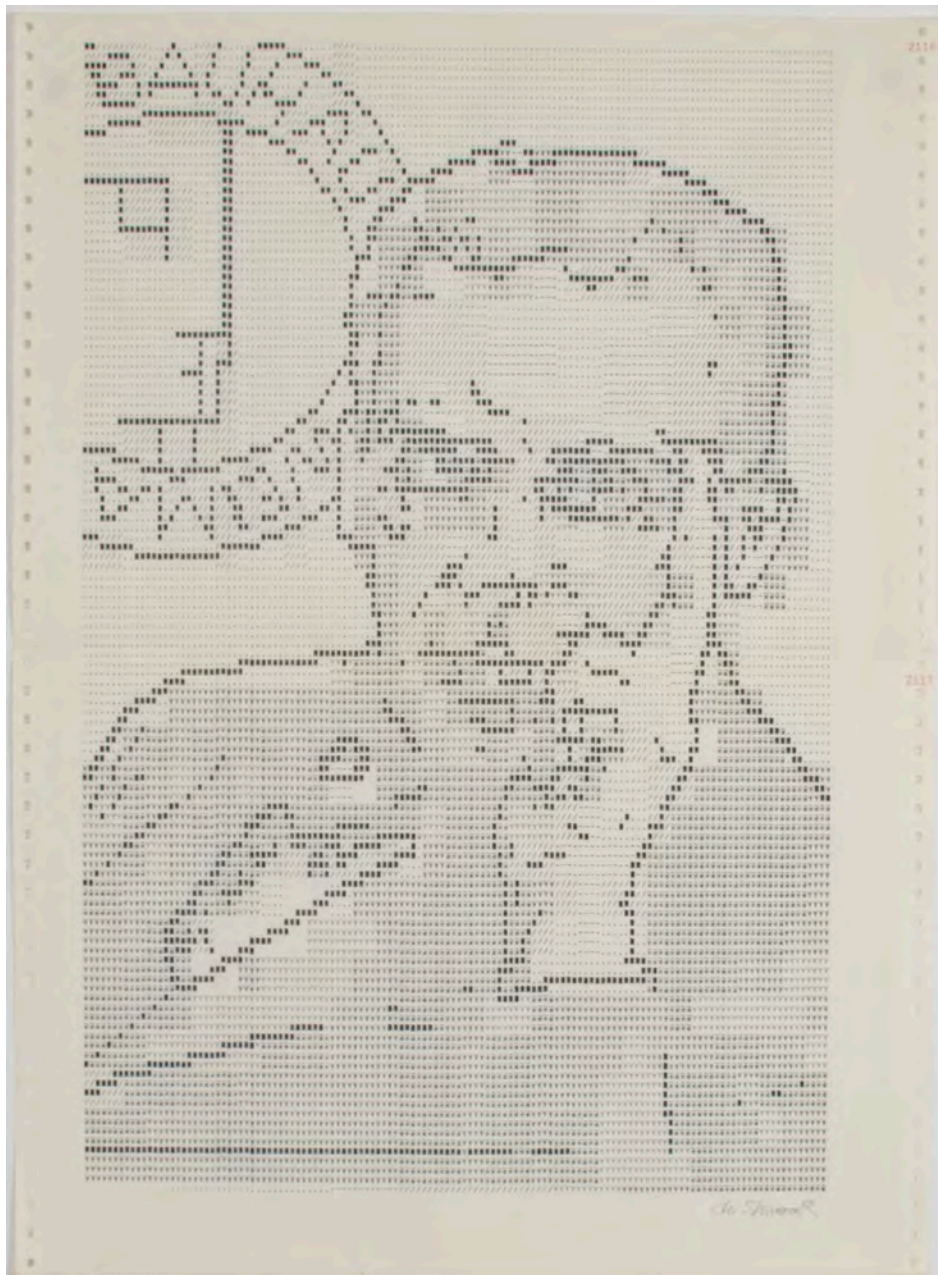
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



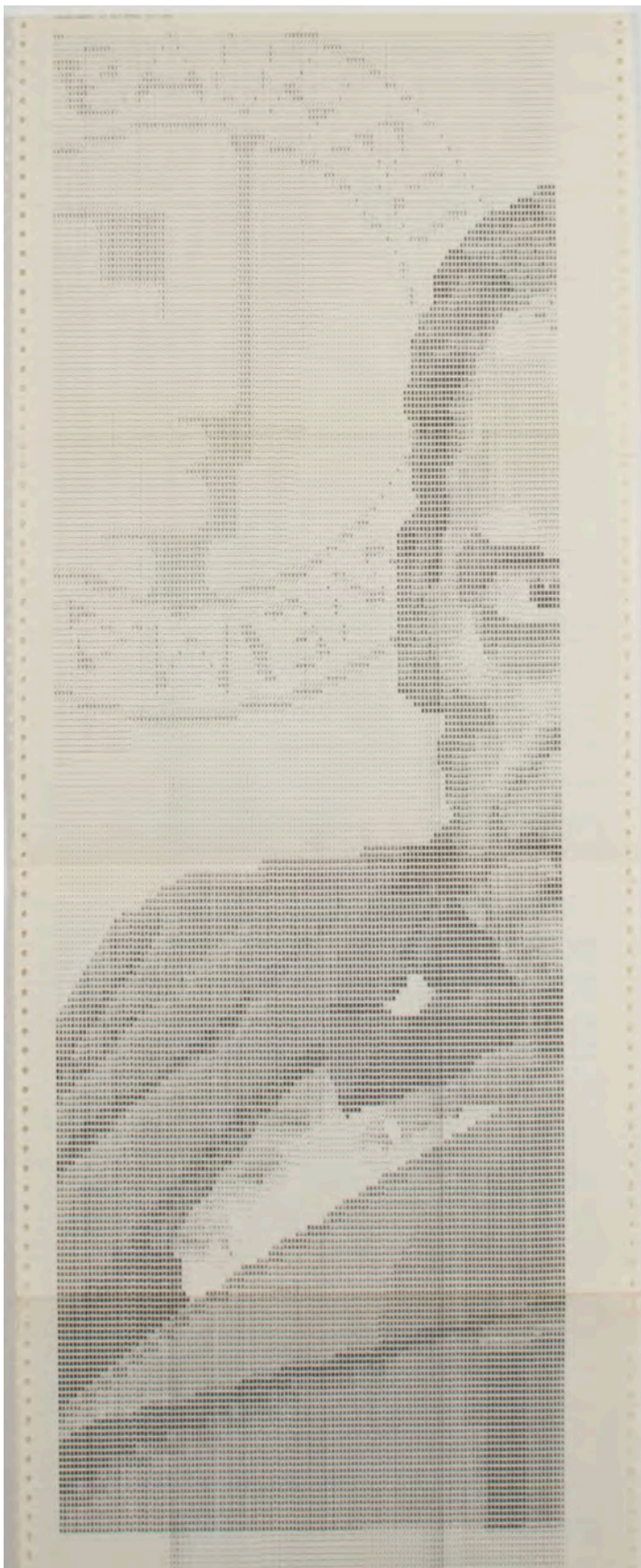
Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original
source code



Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



Gropius series
untitled variation, 1973
plotter drawing in ink on paper
56 x 41cm (image)
accompanied by multiple pages of printed original source code



Gropius series diptych
untitled variation, 1973
plotter drawing in ink on paper
110 x 41 cm (each part)
accompanied by multiple pages of printed original
source code

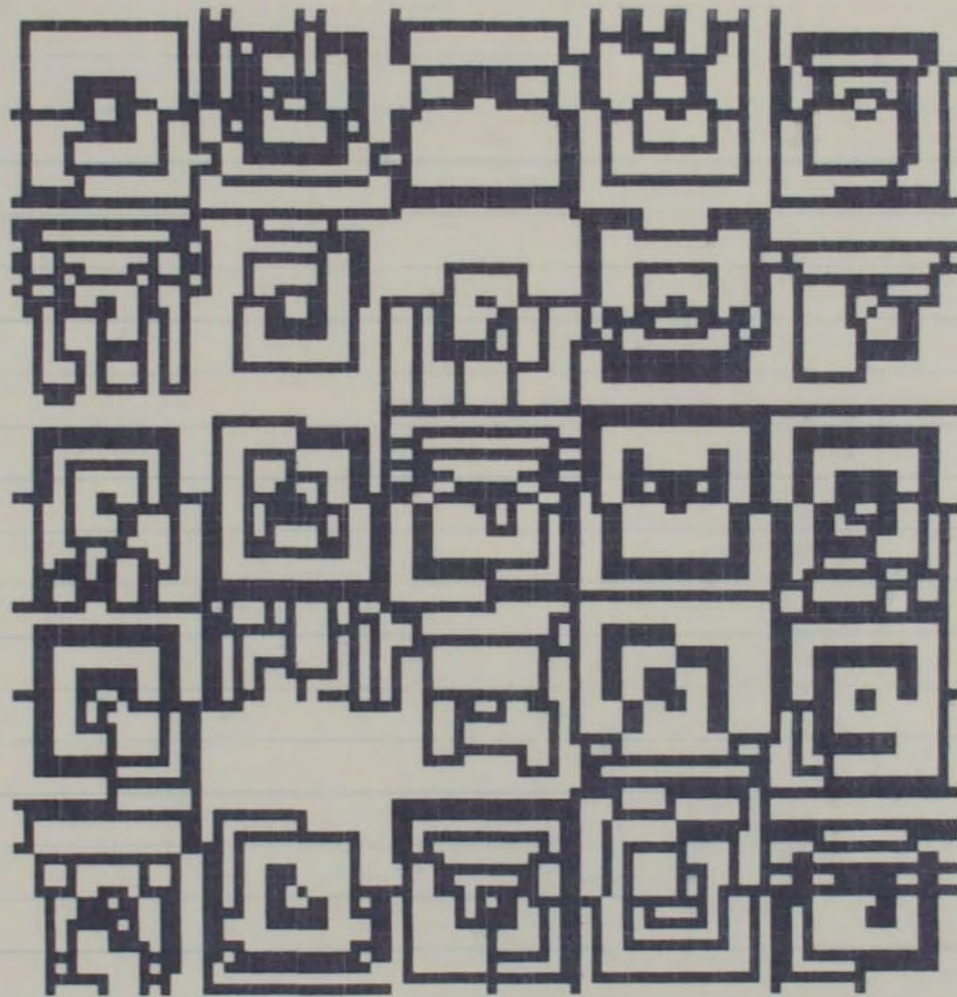


untitled plotter drawing on paper
1978
25 x 29 cm



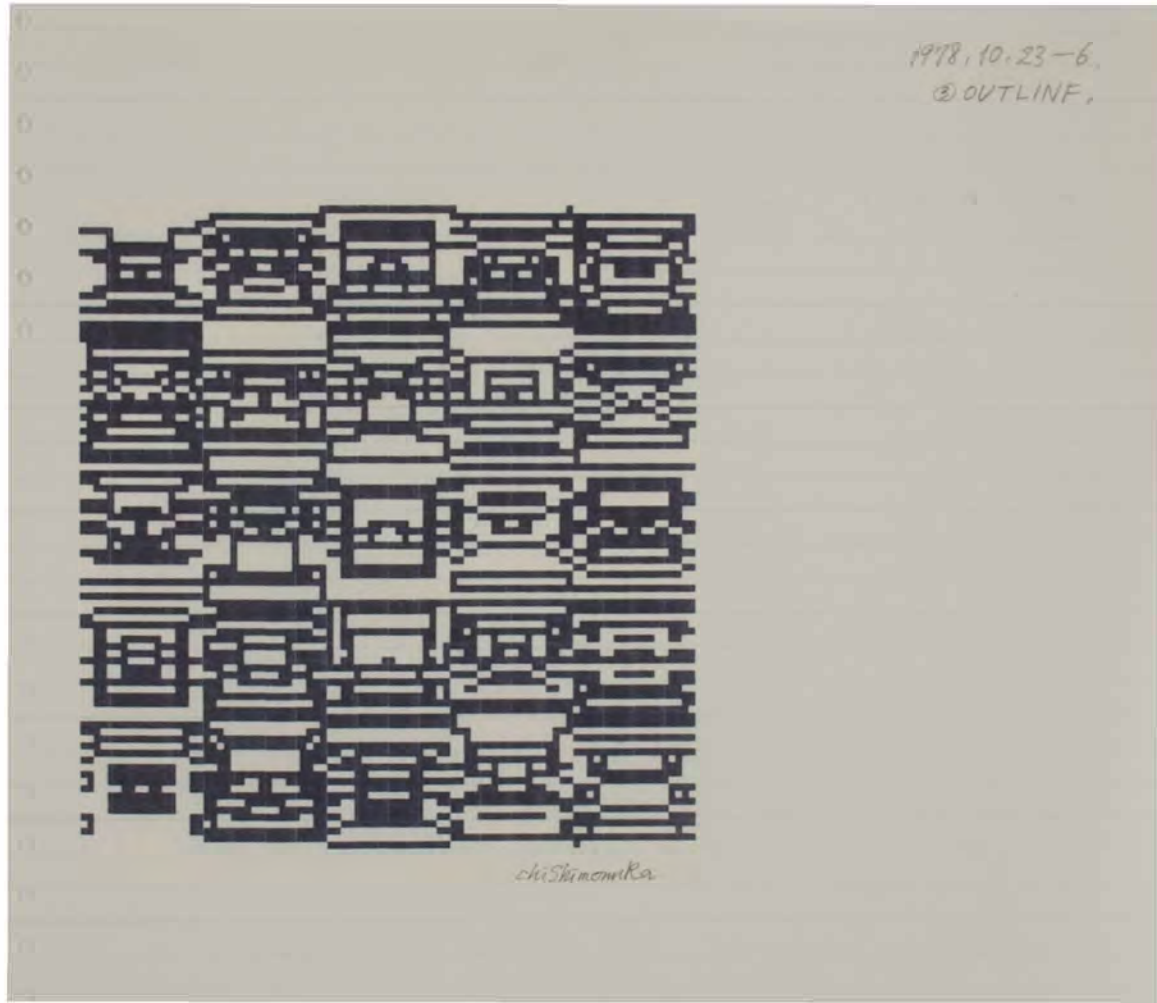
untitled plotter drawing on paper
1978
25 x 29 cm

1978. 10. 23-5.
④ OUTLINE

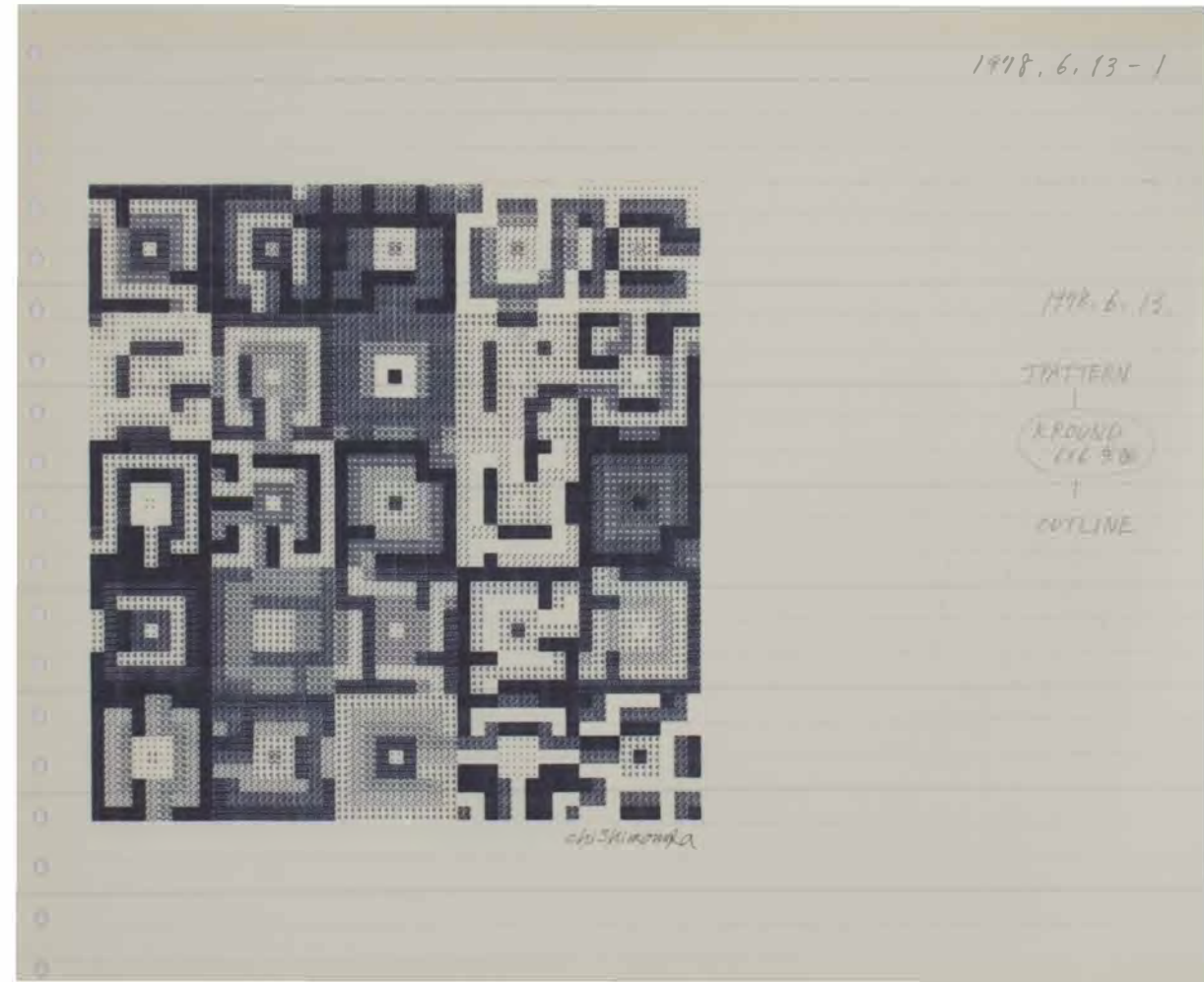


chi Shimomura

untitled plotter drawing on paper
1978
25 x 29 cm

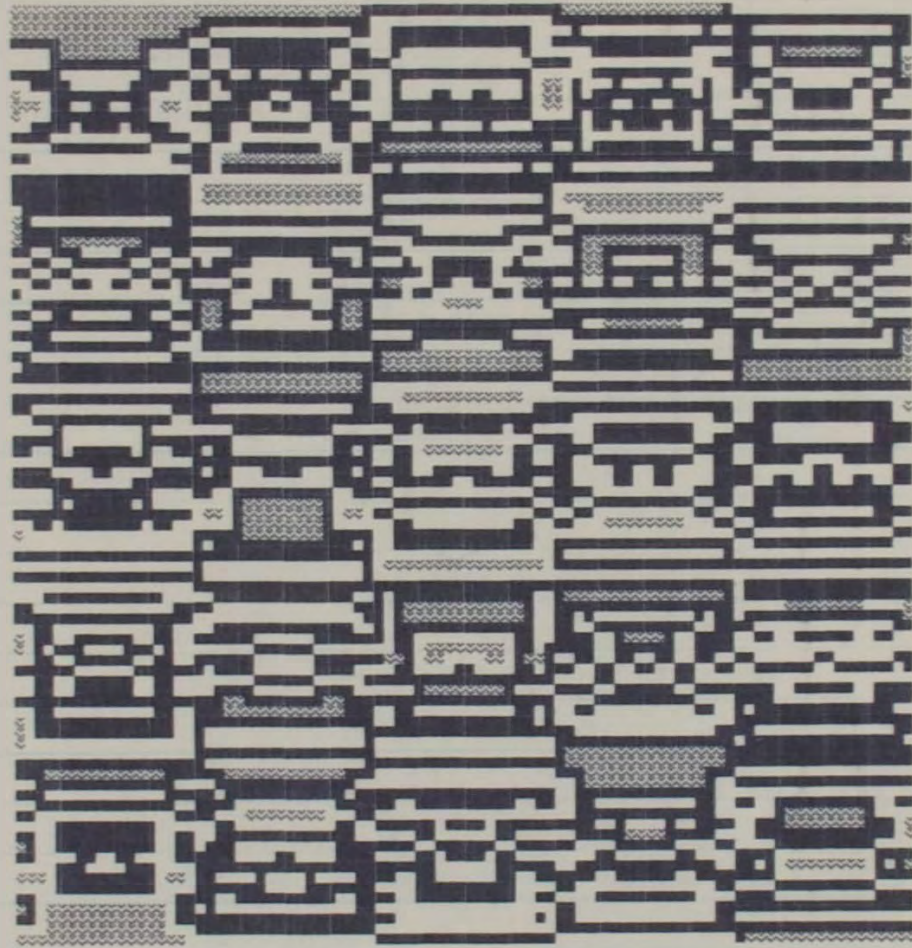


untitled plotter drawing on paper
1978
25 x 29 cm



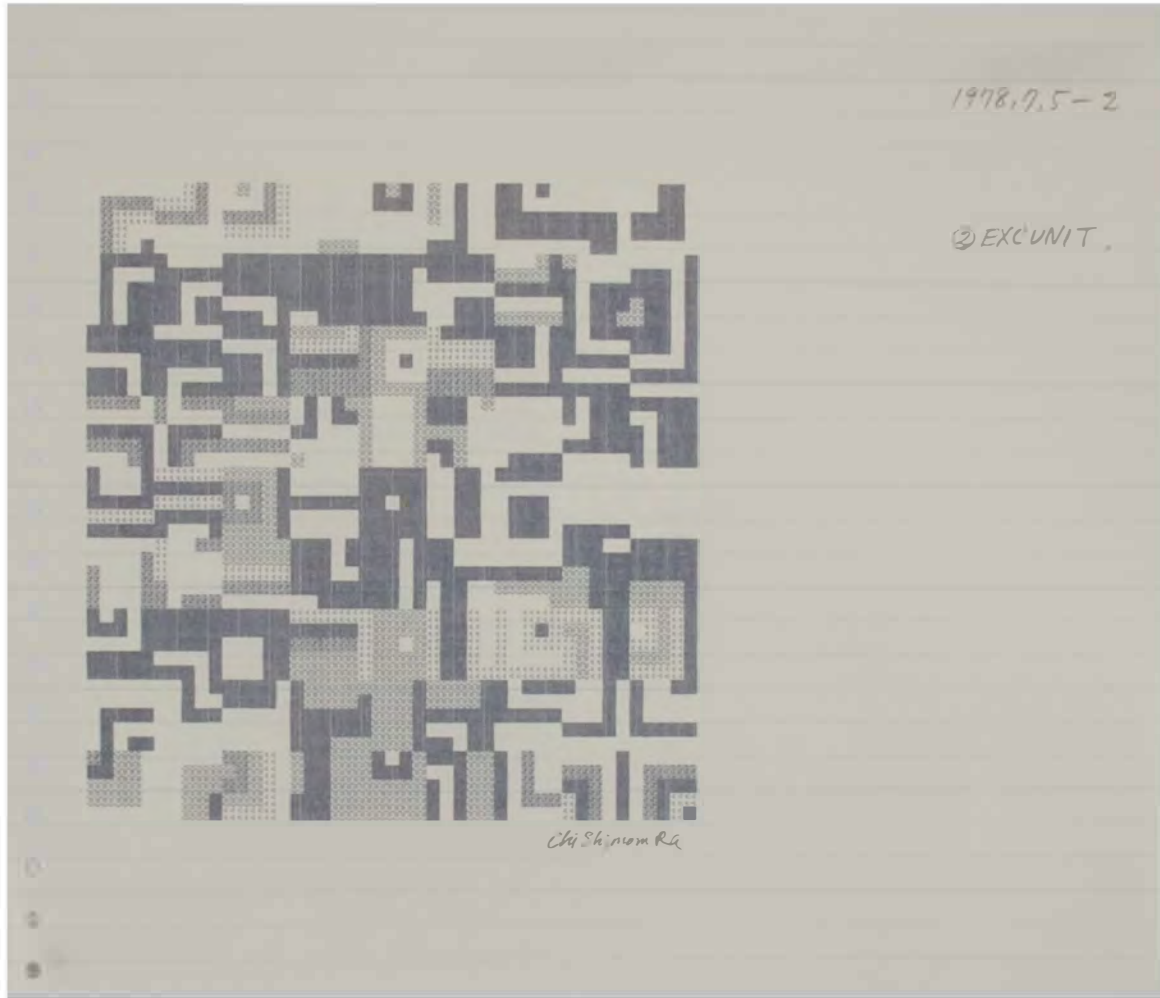
untitled plotter drawing on paper
1978
25 x 29 cm

1978. 10. 23-6.
④ OLINE BW.

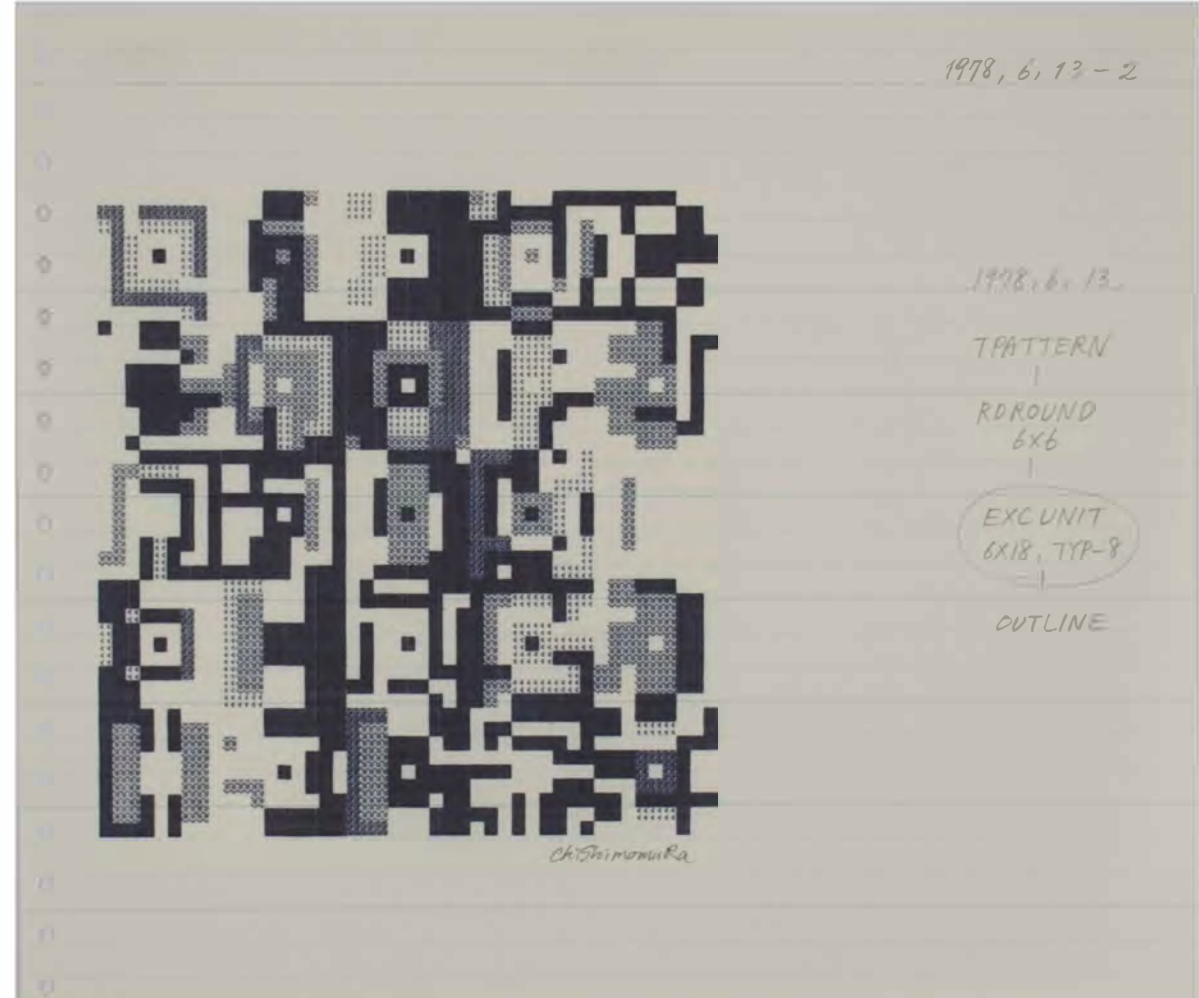


chi (his) moni pa

untitled plotter drawing on paper
1978
25 x 29 cm



untitled plotter drawing on paper
1978
25 x 29 cm



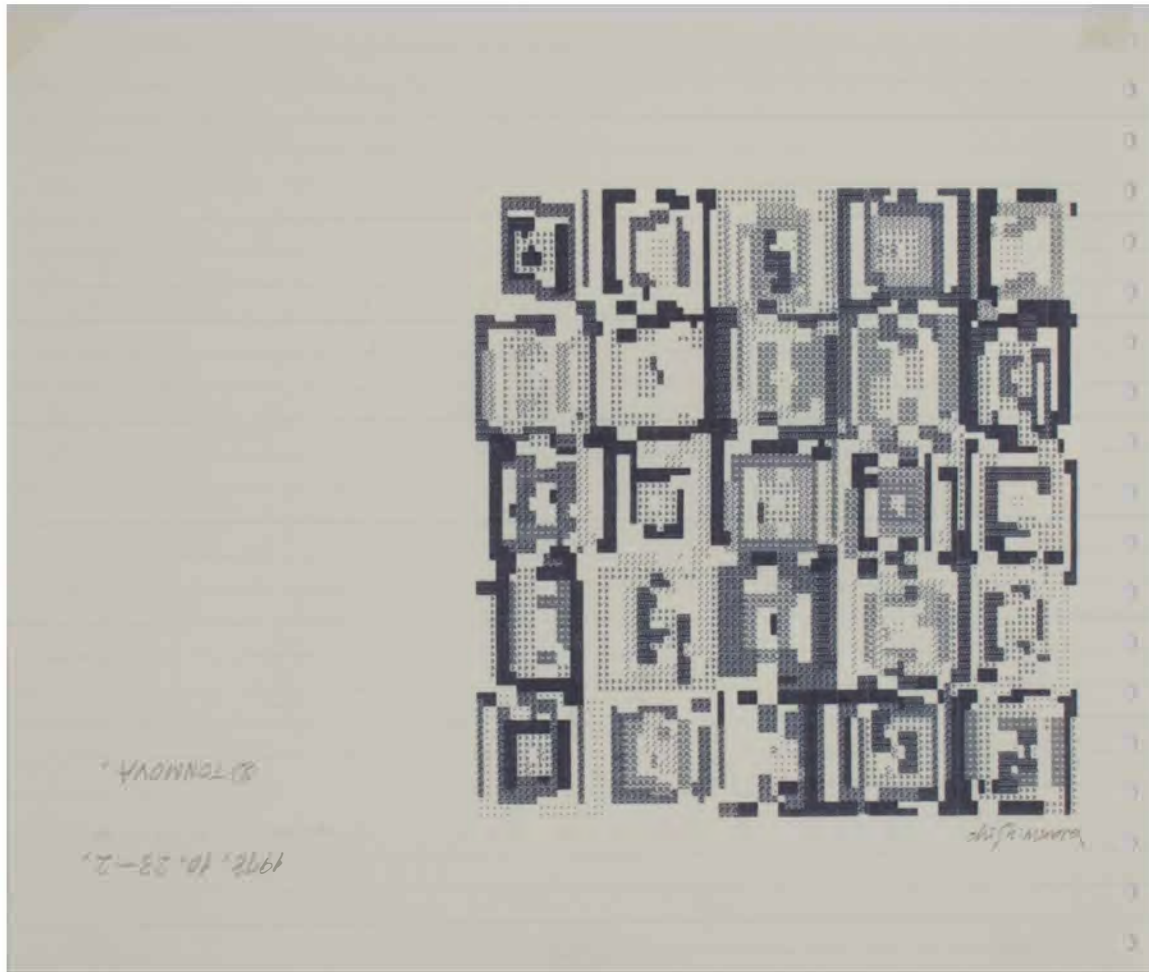
untitled plotter drawing on paper
1978
25 x 29 cm

1978, 10. 23 — 4
① OLINBW,

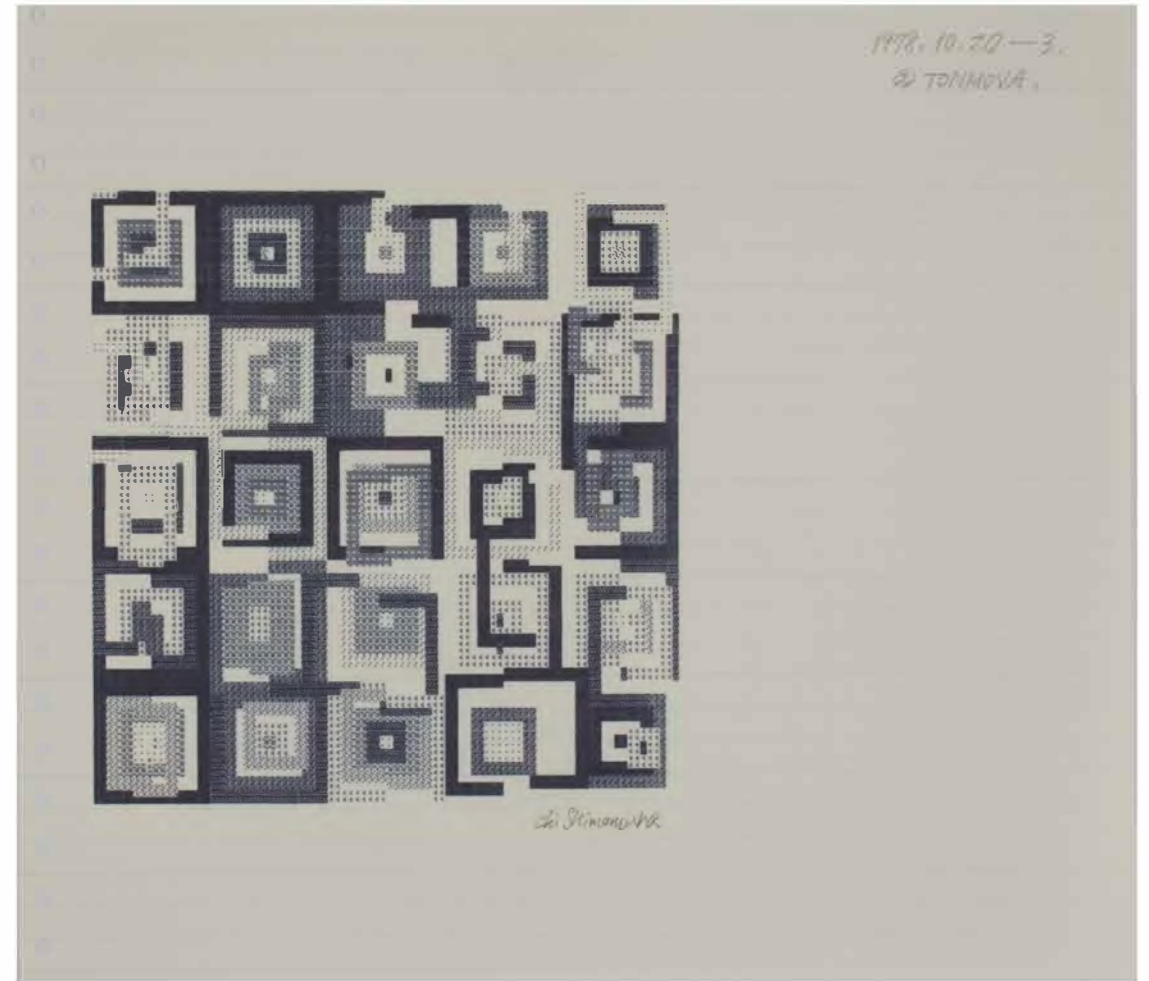


chi Shimozuka

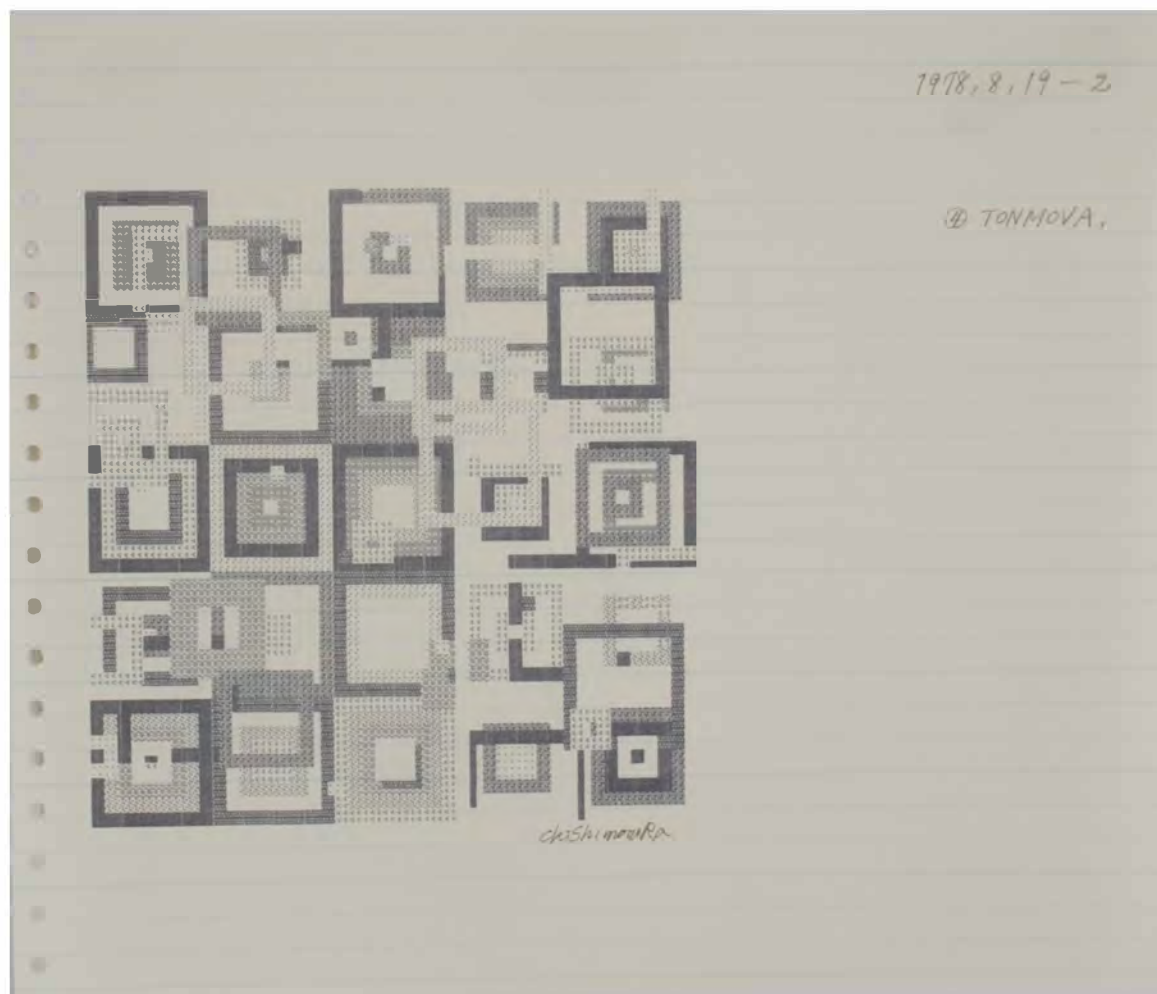
untitled plotter drawing on paper
1978
25 x 29 cm



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untitled plotter drawing on paper
1978
25 x 29 cm



untitled plotter drawing on paper
1978
25 x 29 cm



untitled plotter drawing on paper
1978
25 x 29 cm

Chihaya Shimomura (下村千早)

Born in Hiroshima City in 1941.

1963: Graduated from the Department of Fine Arts, College of Art, Nihon University.

Studied Bauhaus-system design education under Professor Iwao Yamawaki.

Attended Professor Hiroshi Kawano's lectures on "information aesthetics," the first of their kind in Japan.

1965: Completed the Graduate School of Fine Arts, Tokyo University of the Arts (M.F.A.).

1970: Appointed to Musashino Art University, Faculty of Art and Design, Department of Industrial Design, Commercial Design Major (now the Department of Visual Communication Design).

1984: Became Professor, Department of Visual Communication Design (undergraduate), and Professor, Graduate School of Art and Design.

2011: Retired from Musashino Art University.

Fields of Specialization:

Information Design (art/information aesthetics, computer graphics, multimedia, interfaces)

Design Semiotics (semiotics, visual language, design methodology)

Research Focus:

With "information" as a core concept, he creates and puts into practice ideas, fields, and methods of art/information aesthetics and information design from a new perspective on human-computer interaction (dialogue).

Books:

Semiotics Lecture Series -3: Art as a Sign (Keiso Publishing, 1982) — co-author

Image Processing Handbook (Shokodo, 1987) — co-author

Papers and Conference Presentations (selected):

"Computer Art," Graphic Design No. 41 (Kodansha), 1971

"Design and Production of a Graphic Information Transformation System and a Graphic Transformation Processing Language," and related works — Musashino Art University Research Bulletin and presentations at the Japan Society for the Science of Design, 1973-1978

"Research and Production on Theories of Graphic Information by Computer," and related works — presentations at the Japan Society for the Science of Design, 1975-1989

"An Essay on the Semiotics of Design" (co-authored), and related works — Musashino Art University Research Bulletin and presentations at the Japan Association for Semiotic Studies, 1980-1995

"Information Design (1)-(6)" (including "From the Design of Things to the Design of Interaction Processes," etc.) — Musashino Art University Research Bulletin, 1997-2005, etc.

Works and Exhibitions (selected):

"Computer Art Exhibition" — planning/organization and exhibition design; Nihonbashi DIC Building, 1970

"International Computer Art Exhibition" (Ministry of International Trade and Industry) — Ginza Sony Building, 1973

Featured artist in Computer-Grafik; Bilder nach Programm-Kunst im elektronischen Zeitalter (DuMont, 1984)

Featured artist in Computer Graphics - Computer Art (Springer-Verlag, 1985)

1st Beijing International Computer Art Exhibition — exhibited works; jury member; lecture, 1996

"Simulated Color Mosaic" (computer art work), co-created by Kawano + Shimomura — in the collection of the Musée d'art contemporain de Montréal (Canada), 1995

"20th Century Computer Art : Beginnings and Developments : The work and thought of pioneers and contemporary practitioners of algorithmic art" — planning/organization and exhibited works; Tama Art University Museum, 2006

"Ex Machina: Frühe Computergrafik bis 1979" — exhibited works; Kunsthalle Bremen, 2007

"Hiroshi Kawano: Der Philosoph am Computer (Archive Opening Commemorative Exhibition)" — exhibited works (from early K Study Group works to works from the 1970 Computer Art Exhibition); ZKM | Center for Art and Media, Karlsruhe, 2011, etc.

Other Activities:

1970-2000: Member of the Japan Society for the Science of Design; the Japan Association for Semiotic Studies; the Japanese Cognitive Science Society 1988-1989: Visiting researcher, National Aerospace Laboratory of Japan (Science and Technology Agency)

2003-2004: Visiting Professor, Graduate School, Rhode Island School of Design (USA), etc.

