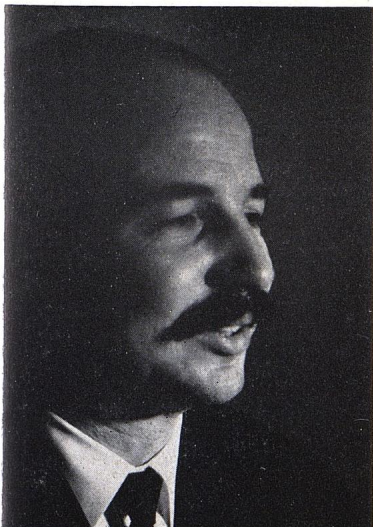


**Print**  
NOVEMBER/DECEMBER 1966

## THE DESIGNER AND THE COMPUTER: AN INTRODUCTION AND A CASE IN POINT

By Martin Krampen



*Editor's Note: Martin Krampen, guest editor of this issue (see photo below), has devoted much vigorous effort toward bringing about "a creative collaboration between designers and the new computer technology." A distinguished graphic designer himself, he contends that designers "can only gain, on the problem-solving level, from a close interaction with the computer."*

*Born in Germany, educated in three countries (Germany, Italy, U. S.), Dr. Krampen received his Ph.D. at Michigan State University in 1962. His teaching experience is extensive, and includes courses given in design and psychology at Carnegie Institute of Technology. For the past four years he has been assistant professor of design and psychology at the University of Waterloo, Ontario. He is currently assistant professor of architecture and industrial engineering at the University of Toronto, Ontario; early next year, he will be a visiting professor at the Ulm (Germany) School of Design.*

*From 1954 to 1962, Dr. Krampen was a free-lance designer, his assignments having included the design of books, magazines, advertising, exhibitions and displays. He subsequently was a partner (1962-64) in Markson and Krampen Associates, which specialized in product design and visual communication. He has recently served as design consultant for Expo 67 theme buildings, CIL pavilion, and color-graphics coordination.*

*Dr. Krampen has carried out research in the fields of symbology, typography and perception. He is editor of the book Design and Planning (the printed version of the annual seminars held at the University of Waterloo), and has published numerous articles in various professional journals. He is a member of the International Signs and Symbols Commission of ICOGRADA.*

*The editors of PRINT wish to express their deepest appreciation to Dr. Krampen for his invaluable aid in the preparation of this issue.*

When the editors of PRINT suggested that, as part of my responsibilities as guest editor, I should arrange to have the cover of this issue made by a computer, I was at first dumbfounded. However, I suppressed my qualms and went ahead with it. As it turned out, my experience in producing the cover became a perfect illustration of the theme of the issue—that a creative collaboration is possible between the designer and the new computer technology—and for this reason I think it would be useful to relate in some detail just how the cover design came about.

The reason for my initial qualms was that, even though I had launched myself into a crusade for the use of computers in design, I had no cathode ray tube with light pen in my studio, nor did I know anyone in the whole of Canada who did have one. Of course, the University of Waterloo had promised that a Calcomp plotter would arrive—except that it wouldn't arrive in time to meet the editorial deadline. Also, though I had worked before with programmers of our Computer Science Department, and had started to learn the fundamentals of programming (by means of a programmed text), I was not yet in a position to write a program myself.

Occasionally, walking to our 7040 room at the University Computing Center, I would fish out of the wastepaper basket strange symmetric patterns composed of typewriter characters—and one day there was even a sequence of "pictures" (done by typewriter print-out) portraying a stripper in successive stages of disrobing. (I was assured that this was a standard program of a computer firm—probably a sales gimmick to impress clients.) This reminded me of other "pictures" I had seen done by the same technique (which has been dear to dactylographers since typewriters were invented). For example, Prof. Bertram Herzog, of the University of Michigan, showed one when he wanted to document the Stone Age of Computer Graphics: Several years ago a

very flexible compiler "language" [see "A Glossary of Computer Terms," page 14], was written at the University of Michigan; it was called MAD (Michigan Algorithm Decoder). Every time the program "hung up," the printer would rapidly type out a version of Alfred E. Neuman's face, with the caption, "What—me worry?"

Since typewriter printout was the only available "graphic display" I had at my disposal, I went to Veljo Taht, one of our programmers, and asked him whether it would be possible to write a little program for a geometric pattern which would go on a magazine cover. He said it would be simple to do.

We decided that I would prepare a sketch in 1:1 scale which, when computer-produced, could serve as artwork for the cover. In preparing the sketch, I had to keep in mind the number of typewriter characters per line (line width) and the number of lines. It took me about an hour to figure out a solution for the pattern I had in mind.

When I took the sketch back to Veljo, we discussed the program a little further. In essence, the instructions to the computer for a single pattern would have been similar to the instructions I'd have given a dactylographer: type 88 dots for line 1, 2, 3, 4 and 5 starting from above. Then, type the first 72 dots in the following line, change to another character for the next eight spaces in that line, and then revert back to dots for the rest of the line. Repeat this special procedure for the next 10 lines—and so forth. In the most primitive case, there would have been a set of 56 cards specially punched for each line, indicating to the computer when to put a dot or another character line by line, plus a few cards for other instructions. At that point I thought, Maybe I should give the job to a typist. . . . But in discussing the program further, I remembered that my pattern was based on a grid of 11 x 11 units. These units could take on four color states, as for example: empty (white), black, gray, and red. Also, there was a special state each single grid unit could take on: it could be divided diagonally and take

on two color states. (This was typically a designer's thought!) However, Veljo said it would be easy to translate into a more general program which could produce all kinds of printout patterns based on four colors and plain or diagonally divided grid units.

He wrote and debugged [see Glossary] the program in one hour. Next, we went one morning and tried out all kinds of shadings produced by different typewriter letters. By simply changing one card, Veljo could introduce another character. Each time, a completely new pattern was printed out in less than a minute. By looking at the effects of various characters, we decided that the letter H produced the "blackest black," etc. When the computer had printed out a few copies, I thought (again, a typical designer's thought): Wouldn't it be marvellous if the printout typewriter had dots of different sizes on the keyboard and a ribbon with two or three colors! I think we could then produce wonderful, Seurat-like "paintings!"

This is an example of a trivial use of a computer to produce graphic output (Walter Allner used a more sophisticated program and more sophisticated equipment to produce Fortune's July 1965 cover. He also used more programming time and more computer time. See page 33.) At the same time, it is an example of how the designer and the computer specialist might work together in the future. If the designer can clearly present the structure and flexibility he wants for his graphic presentation, the programmer will be able to translate the designer's language into the language of the computer.

One of the objectives of this issue is to make the designer aware of how far computers and Computer Graphics have penetrated into the realm of his profession. He cannot any longer ignore these developments. At the very least, he must learn a little about the computer specialist's jargon (which is why we have included a "Glossary" in this special issue).

To my knowledge, the best example of effective collaboration between graphic

designers and computer people is the work done or supervised by William A. Fetter [See "Computer Graphics at Boeing," page 26], whose approach to the problem is very expressive of his background as a graphic designer: He sees the computer simply as an aid to communication. While the present technology of the Boeing approach might be revised by the introduction of the light pen, the achievements so far are spectacular (witness the "human figure" project and think about its implications for human factors studies, automobile safety tests, environmental simulation, anthropology, etc.).

Most Computer Graphics projects are piloted by engineers, some of whom (like Steven A. Coons, of M.I.T.) have a keen feeling for the creative implications of the interaction between designer and graphic display. At the Bell Telephone Laboratories, for example, Michael Noll thinks of the computer as a "creative medium for visual arts" (as well as a means for technical display). And at the University of Waterloo, Maurice Constant is suggesting a motion picture language from a filmmaker's point of view.

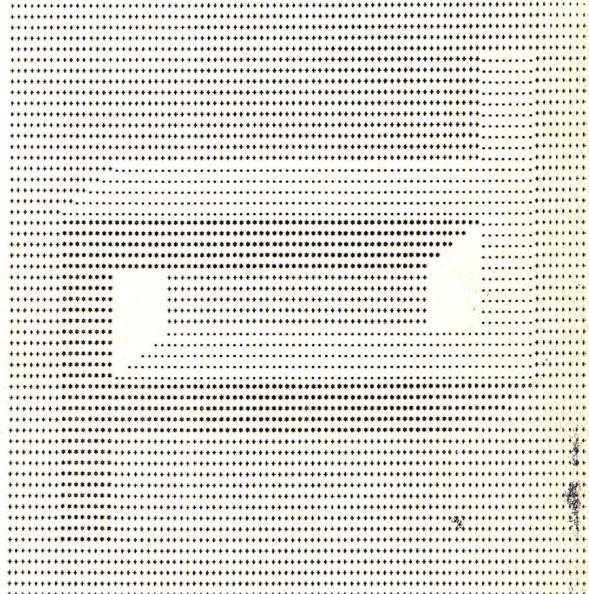
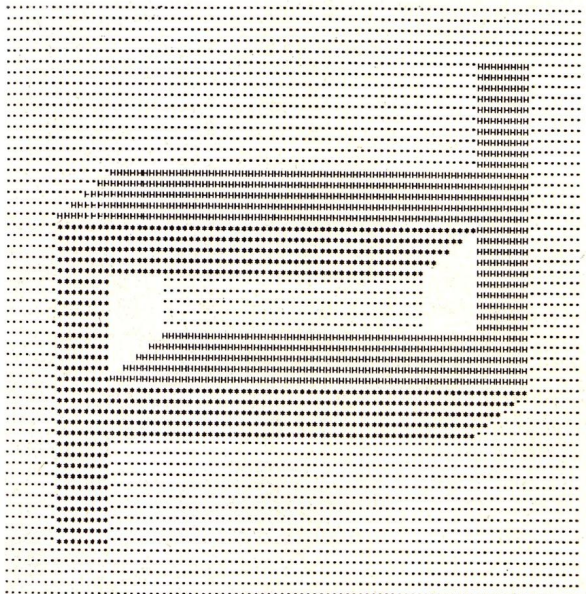
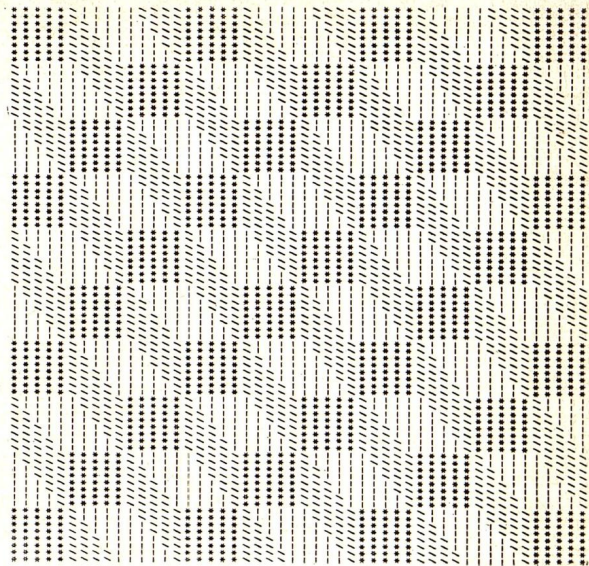
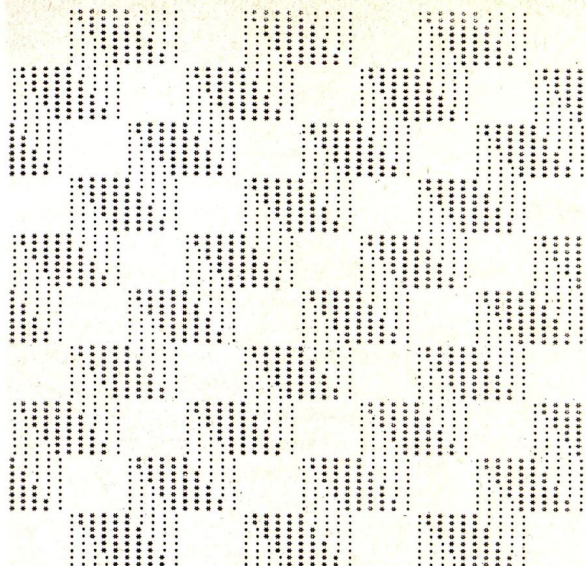
With all these challenging possibilities, isn't it about time that those in the graphic design profession took an active interest in this new medium?

Program for this issue's cover design.

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C0304V.TAHT
RJOB MATFOR C0304V.TAHT
EXECUTE MATFOR
1 88FC PAGE
2 DIMENSION ND(12,3),MDE(2)
3 INTEGER ALPH(9),OUT(13)
4 PRINT 7
5 READ 1,ALF
6 1 FORMAT(9A1)
7 READ 2,MC,NL
8 2 FORMAT(2I1)
9 READ 3,N1,N2,N3,HAZ
10 4 FORMAT(5I1)
11 N=1
12 IF(NLE.0) GO TO 15
13 NL=ALF(ND(1))
14 GO 16 J=1,N1
15 16 QUIT(1)
16 15 IF(NLE.0) GO TO 9
17 HAZ=ALF(MAZ)
18 GO 17 J=N2+1
19 17 QUIT(1)
20 9 READ 3,N1(ND(1,1),J,1),J1,1=1,121
21 5 FORMAT(4D2)
22 IF(NEQ.0) GO TO 99
23 NONNL
24 DO GO K=1,N
25 I=1
26 K=N+1
27 IF(ND(1,1),J,1) GO TO 11
28 M=HAZ
29 HAZ=MC(MDE(1))
30 H=ALF(H)
31 H=ALF(H)
32 IF(ND(1,1),J,1) GO TO 22
33 25 H=H+K-13*NC/(NL-1)
34 GO TO 26
35 24 H=H+K-13*NC/(NL-1)
36 26 H=ABS(ND(1,1))
37 H=ALF(H)
38 IF(ND(1,1),J,1) GO TO 22
39 DO 30 J=N2,NL
40 30 QUIT(1)
41 30 QUIT(1)
42 30 QUIT(1)
43 22 H=H+K-13*NC/(NL-1)
44 GO TO 23
45 21 DO 20 J=N1,N2
46 20 QUIT(1)
47 20 QUIT(1)
48 20 QUIT(1)
49 20 QUIT(1)
50 20 QUIT(1)
51 20 QUIT(1)
52 20 QUIT(1)
53 20 QUIT(1)
54 20 QUIT(1)
55 21 DO 20 J=N1,N2
56 20 QUIT(1)
57 20 QUIT(1)
58 20 QUIT(1)
59 20 QUIT(1)
60 20 QUIT(1)
61 11 PRINTS(OUT)
62 5 FORMAT(1X,13A1)
63 20 CONTINUE
64 GO TO 4
65 90 PRINT 7
66 7 FORMAT(1X,1)
67 CALL EXIT
68 END
ENTRY EXECUTION

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*Shown are sample designs produced by the same program which produced the cover. It should be noted that the design for the cover emerged from the computer in black-and-white, looking much like these samples. The colors which appear on the cover were chosen by Martin Krampen and PRINT's art director.*