A quarterly Review of International
Visual Communication Design

Issue number 6, 1973

icographic

6

Price per issue 1 US dollar

Published in London by the
International Council of Graphic
Design Associations

Contents include

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The Women's Design Program
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Alphanumeric symbols for mosaic printers and display tubes
LoCoS—an experimental pictorial language

Hubert Grooteclaes

LETRAGRAPHICA

① BOMBERE

② Magnificat

③ stilla

ASTRA BEANS borderline

GOOD VIBRATIONS JOG LINE

Le Griffe PICCADILLY

PROCESS ROCO Shatter SUDS

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Derek Birdsall

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Letraset

icographic

A quarterly Review of International
Visual Communication Design

Introduction

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Executive Editor	Patrick Wallis Burke
Contributors to issue number 6	Sheila Levrant de Bretteville J M Dirken, H van Campenhout, W Crouwel, J L Kroes, et al Jeremy J Foster Sydney Lewis Yukio Ota
Published quarterly by	The International Council of Graphic Design Associations *all correspondence to* 7 Templeton Court, Radnor Walk, Shirley Croydon CRO 7NZ, England
Sponsored by	Letraset International Limited St George's House 195 Waterloo Road London SE1, England
Paper supplied by courtesy of	Culter Guard Bridge. Salisbury Square House Salisbury Square, London EC4 Cover printed on Hi-Fidelity Art Board 280g/m Text printed on Hi-Fidelity Art Paper 118g/m
Printing of issue number 6	Pan Litho Limited 246 Kilburn Lane London W10, England
Design and layout of issue number 6	Patrick Wallis Burke Herb Gillman
Acknowledgements to	School of Graphic Design Ravensbourne College of Art and Design
Subscription rates	
Countries within Europe Subscription rate for 4 issues (including postage)	US Dollars 3.50
Countries outside Europe Subscription rate for 4 issues (including postage 2nd Class Airmail)	US Dollars 7.00
Recommended price per issue	1 Dollar (USA) 40p (UK) 3.5 DM (FGR)

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I suppose that each of the contributions to this sixth issue might be grouped under the heading of *exploration*. They each represent attempts to extend the boundaries of that collection of activities that currently characterize graphic design.

Sydney Lewis, the quiet American who is currently Vice-President of Icograda, has just spent a sabbatical year studying in Great Britain.
He discusses the growth of the present dichotomy between the artist and the designer in terms of the historical development of their respective roles in society.
He concludes that it is the present-day designer, rather than the artist, who works closest to the traditional role once accorded to the artist by society. The comparitively modern practice of placing 'art' in isolation represents a radical departure from the past. It effectively locks art away from the intellectual and spiritual commerce of the real world. It pushed the artist out of the mainstream of cultural life, away from his former intimate and interpenetrating relationship with the community. It renders him an alien, an oddity, an eccentric extra to the real business of life.
Probably most designers are too busy to give much thought to philosophical distinctions that may be drawn between their role and that of the artist. And the author concedes that the study of the philosophy of art is not a necessary prerequisite for the successful practice of design. Nevertheless, he holds to the view that thinking about the 'art activity', although it may be of uncertain value, can add to the designer's *psychic* income, and may possibly heighten the significance of his work.

Sheila Levrant de Bretteville is a young American *woman* designer.
The reason for my stressing the sex of the contributor will become clear when reading her article.
In what I believe to be one of the most interesting and thoughtful articles published in this journal, she examines the design process from the perspective of a woman designer.
She argues that the design arts reinforce existing stereotypes for the behaviour of men and women.
She points out that the mass media traditionally use simplification in order to isolate their messages or appeals. But this is a kind of simplification that denies the complexity of real-life experience.
In advertising, for example, only women are allowed to be shown as crying, doubting, making mistakes. Only women are seen as nurturing or as providing emotional support for children and men.
The iconography for men is equally rigid. Men are shown as serious, decisive, professional, assured.
Men lead, control, dominate. Women are exclusively emotional, hesitant, co-operating and helping others. In this way the distinctions between male and female are polarized.
We are shown what men and women *ought* to be. This simplistic division of male and female is reinforced and legitimized.
Her article carefully argues the case for designers to re-examine those values that are traditionally labelled 'male' and 'female'. They should take a closer look at a created environment which all too often reflects only a limited set of 'male' values—those concerned with progress, status and power—and edits out as 'imperfect' those characteristics that are denoted 'female', simply because they are more difficult to predict and control.

Sheila de Bretteville also helped to evolve the *Women's Design Program* at the California Institute of Arts.
This interesting venture was concerned with trying to discover the design implications of feminism.
We publish a brief selection of some of their graphic work.

A design team from the Department of Industrial Design and Electrical Engineering at the University of Delft has been working on the problem of developing a teleprinter with a print-out that makes use of a mosaic dot alphabet, rather than the traditional typewriter principle.
The authors, Messrs Dirken, van Campehout, Crouwel, de Kroes, et al, describe the present state of their investigations. A device has already been developed which uses electro-magnetically driven pins on to pressure-sensitive paper.
Many advantages would seem to follow from this particular refinement of the teleprinter—greater speed, less noise, additional copies, and a wider range of characters (upper and lower case).
The graphic team, under the direction of Wim Crouwel, has developed two mosaic alphabets and it is intended that considerable research will be undertaken, with a view to further refining their efficiency.
It is our hope to publish further reports on this interesting project as they become available.

Early writing systems show that most ancient scripts must have been developed from pictorial sign forms of some sort, rather than from abstract marks.
The pressures of spoken language gradually turned these scripts into partly phonetic systems.
Pictorial graphic sign systems did not disappear, however, and they have recently enjoyed a significant renaissance along major roads and in international airports.
Yukio Ota has spent a number of years trying to devise LoCoS,

an experimental pictorial language. It makes use of 18 pictorial elements and words can be formed through various combinations of these elements.
It is a logographic writing system (similar to Chinese *Kanji),* in which the characters represent morphemes —that is units of form and meaning—rather than units of sound, such as syllables or phonemes.

Our last contributor, Jeremy Foster, discusses legibility research or, as he puts it, the ergonomics of print.
Legibility research has been concerned with studying the effects of visual information format on the responses made to it by the reader.
Jeremy Foster proposes a 2-way categorization scheme of legibility, with the aim of showing how the main areas within the subject are linked.
He also summarizes some examples from each of these main areas of research.

Executive Editor

The working man's philosophy of art

Sydney Lewis

Sydney Lewis has headed his own design and printing firm for ten years. He has just completed a sabbatical year of study at London University reading Philosophy of Symbolic Form. He is currently a vice-president of the International Council of Graphic Design Associations

The various factions that constitute the design profession have many similarities.
No matter what field he works in, the designer is likely to be rational, goal-directed, sophisticated but simple in his tastes, energetic, pragmatic and, if he hasn't been damaged in the competitive struggle, sensitive to human feelings and aspirations.

Most designers are too busy to think often or deeply about their membership of the greater design community.
Although calls for unity and understanding in the design profession are met with favourable responses, there are differences of opinion about where the boundaries should be drawn.

Recently, F H K Henrion, a former president of Icograda and a highly successful graphic designer, argued lucidly and persuasively that design in all its aspects is indivisible, and that the blinders of conventionality worn by the specialist will prevent him from finding the best answers to today's far-ranging problems.
And then, in linking the design community into one whole, he specified where its boundary lies:

"There are important common denominators in all specialist areas, ranging from visual communication to product and engineering design, through fashion and textile design, pottery, jewellery, furniture and, in fact, every aspect of design.
I should like to draw a distinction between the field of fine art and design by saying that fine art is primarily communication through self-expression, while in design self-expression can never be the primary ingredient.
Every design problem is much nearer to a scientific problem in as far as it has to be solved within given constraints." (1)

As Henrion sees it, there are many common denominators that can bring designers together, and one crucial barrier that separates all of them from the fine artist.
An objective, rigorous methodology is required of the former, while the latter are likely to be emotional and narcissistic.

I would support Henrion's claim that specialization in any creative role is inherently crippling, but would push it further than he, and argue that the designer of today is a true artist in the historic sense of the word, and can do a great deal to restore strength and vitality to the fine arts.

One part of the picture that disturbs Henrion is, I am sure, the tradition of the artist as a bundle of powerful emotions, bursting out in violent eruptions of paint, music or dance. It was officially buried by aestheticians at least fifty years ago, but its ghost is remarkably healthy.

Dr Thomas Munro, in describing the subjectivism of Western art, writes:

"Many Western artists are eager to display before their public their moods of anxiety, frustration, discontent, mockery, rejection, exclusion and resentment toward the modern world ... The Western artist may not try to change his psychic discords into harmonies by self-discipline; he may prefer to vent them impulsively and perhaps aggressively for what they are." (2)

Again, this rather simplistic view of the artist is too limiting to stand much examination.
If a musician writes a symphony which contains both "gay" and "tragic" sections, are we to assume that he waits until the proper mood has seized him for each section?
Is every painter of nudes lascivious?

Among those who see any expressive role for art, it more commonly is regarded as a facet of human feeling made visible by the artist, reflecting the sensitivity of his mind and the eloquence of his hands, rather than the unbridled display of a private emotional state.

Equally simplistic and distorting is the image of the designer as a cool, detached, calculating scientific manager, directing his creative energies toward the solving of problems under the formal constraints imposed upon him.
This description fits him part of the time, or perhaps the discipline it suggests acts as his professional superego, but certainly there is something in his work which separates him sharply from the most gifted computer programmer.
For one thing, he is likely to spend a great deal of time and effort in seeking the solutions to problems that cannot easily be quantified.
Part of his mind may live in the world of weights and measures, while another very important part, will be concerned with the language of colour, the implications of shape, the emotional connotations of texture, heft, balance.
It is his sensitivity, the disciplined passion of his strivings which, together with his intelligence and his tendency to work out solutions with his hands, link the designer with the artist, as part of each other's identity.

Another reason for the traditional separation between the designer and the artist is the endlessly proliferating, jumbled set of boxes the art historian and the art critic provide for the visual artist.
Designations like *Mannerist, Abstract Expressionist, Superrealist,* tend to affront anyone who knows the importance of keeping a clear connection with the real world.
These titles should be kept in perspective. They're an occupational hazard for the painter: the designer should rejoice in being spared the examination of scholastic critics.

A more useful set of lenses for seeking out the essential nature of the art form is provided by the philosophy of art.
Sometimes it's called aesthetics, but because aesthetics ordinarily includes the study of all forms of beauty, including the natural flora and fauna, it's too broad an umbrella.
To the extent that philosophy is a means of providing a workable series of concepts for the study of a human intellectual enterprise, it will serve for our purpose.

One point must be granted in advance.
Although the study of philosophy can be pleasant and absorbing, it is in no sense necessary for the successful practise of design in any of its branches.
It is my belief (not widely held) that thinking about the art process is a useful if uncertain activity, that it can immeasurably improve the designer's *psychic* income as he goes about his work, and that there is a reasonable chance that it will heighten the significance of his work.

To argue the case for the relevance of philosophy it will be necessary to look at the history of art from a conceptual, not stylistic, point of view. We must understand what art meant to the Greek sculptor, the medieval maker of icons, the Renaissance painter of religious and royal epiphanies.
Our definition of art has changed radically since the establishment of a large middle class.
Only the last three centuries has seen the word "art" refer to objects to be placed on a wall or pedestal for the pleasures of contemplation.
Before that art was a utensil, destined for practical purposes.

"As we survey the artworks of the past from the earliest cave art onwards we find that, various as their uses were, by and large all works of art were made for a use.
A magical fetish, a temple to honour the gods and glorify the community, a statue to honour a man's memory (Greece) or to insure his immortality (Egypt), an epic poem to preserve the traditions of the race, or a totem pole to enhance the dignity of the clan—these were all artifacts, manufactured for a purpose other than what we should now call aesthetic ... They were essentially "utensils" in the same sort of sense that a suit of armor, a horse's harness or objects of domestic service are utensils, though the

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purpose they served was not necessarily a material one." (3)

It was only with the growth of industrialism and the development of a large body of middle-class gentry that the work of the artist moved from its central role in the mythos of the community to its new role as tangible property, to be displayed for private show, and to be valued as much for capital appreciation as intrinsic beauty.

As an unfortunate consequence, artists were gradually moved from the mainstream of life, both religious and secular, and made into a captive class, dependent on the rich patron as a class, and permitted to play the life of the fool with its liberties and uncertainties.

If you cast your eye back on the role of the artist before the eighteenth century, you may agree that today's designer carries on his traditions more faithfully than the painter, scupltor, or dancer.

The main body of the designer's work is secular, but without doubt he is the inheritor of the functional role of art.

Not the simple usefulness of a pair of shoes, but the broader usefulness of a handsome book read by thousands, or a building interior designed to serve as living space for changing throngs.

We are now approaching the problem of function in art—an issue that poses the central question in the philosophy of art.

One answer is quite congenial for both the designer and the artist.

Another answer separates them with an inpenetrable wall.

The dispute hinges on the larger meaning of the word "useful," one that is close to "instrumental."

For example, no one would argue that the canvas in a painting would make a warm garment, but can that painting serve a purpose in the way a book serves a purpose?

Is it primarily a thing of beauty, or luminosity, or can it carry a meaning and serve as a kind of iconic sign?

There is a large and respectable body of British thought which doesn't like the association of "meaning" and "art."

Both concepts are slippery enough; to join them is to put two worms in harness.

So the formalist school concentrates on the qualities of art that take it away from ordinary life; focuses on the aspect of art that "displays" or shows itself.

"Perhaps the most distinctive feature of practical aesthetic attitudes today has been the concentration of attention on the work of art as a thing in its own right, an artifact with standards and functions of its own and not as an instrument made to further purposes that could equally be promoted otherwise than by art objects ...

A work of art, it is now held, is in concept an artifact made for the purpose of being appreciated in the special mode of aesthetic contemplation." (4)

Richard Wollheim, in *Art and its Objects,* develops with great imagination and logical rigour a number of concepts under which art can be considered in the *contemplative* mode.

It was not his intention in his essay to meet head-on the question of functional versus formalist theories of art, but even in dealing with it tangentially his writing is provocative.

The growth of the view that works of art are made for aesthetic contemplation, rather than to serve an indispensible purpose in human communication, is understandable in terms of the very history we have discussed.

As the artist leaves the mainstream of cultural life, and his former intimate and interpenetrating relationship with his community is broken, his works are acquired by museums and tycoons for their galleries, and he becomes separated, alien, almost exotic.

Not only does the practise of placing art in isolation represent a radical departure from the past, it effectively locks art away from the intellectual and spiritual commerce of the real world, and thus from any area the designer would be willing to share.

There is another way of looking at art, a quite respectable way, that should be more familiar and appealing to the designer and the artist.

This "instrumental" view of art is best expressed in the works of Susanne Langer, an American philosopher now in her late 70's, who has been developing her unifying concepts for the past forty years.

Her best known works are *Philosophy in a New Key* and *Feeling and Form.*

In her *Philosophy in a New Key* Professor Langer describes art as *significant symbolic form.*

The ineffable, unstateable world of feeling and experience is transformed and made visible through the agency of art. As a result of this transformation, an intellectual process akin to "imagining" or "abstracting," the created work can carry meaning in a way that is similar but not identical, to the way words carry meaning.

There are some domains of expression, such as the technical, scientific, factually descriptive, where only discursive verbal forms, words united in chains through conventional syntax and paragraph structure, can carry forward essential intellectual tasks.

There are other domains, equally important, that call for sensitivity, sympathy for the human condition, awareness of religious or mystical grandeur, the possibilities of human joy or tragedy—for which matter-of-fact language can provide no adequate fulfillment.

It is here that the artist finds his primary function and discharges it.

He provides the "utensils"—whether in canvas, stone, or clustered notes—that enable us to make powerful human experiences visible and shared.

This vision of the art process fits the designer as comfortably as a studio smock.

For the graphic designer, particularly, the choice assignments, in terms of professional pride, are usually the ones created for humanistic organizations like Unesco, community services, the educational institutions, theatres. In preparing his original sketches and planning the elements that will constitute the finished piece, he is likely to keep in mind the history, purposes and significance of the organization he serves.

Here the designer becomes an artist, even though temporarily.

He strives to provide a sense of shape, of texture, of form that is evocative of its subject.

In most cases the words are already written; he's not responsible for the literal aspects of the message.

It is the powerful emotional connotations that are his territory.

When he works this way the designer is hewing close to the ideal of the artist held by the Greeks, the Romans, and all their successors until the 18th century.

The idea that works of art can act as symbolic forms of expression and reflect the most crucial aspects of human feeling is only new in the sense of having been made philosophically explicit. Yet it is apparent that this functional role, in its deeper sense, made classic sculpture and painting enormously significant, and gave power to the Bach masses and cantatas.

When the designer determines the form and aspect of products that honestly epitomize their times and social setting he is revivifying the strongest line of the artistic tradition.

Selected references

1 F H K Henrion *Wider Horizons of Design,* Address to the 1972 Conference of the Association of Art Institutions, Sheffield Polytechnic, England

2 T Munro *Oriental Aesthetics* 1965

3 Harold Osborne *Aesthetics and Art Theory* 1970 p26

4 Harold Osborne, op cit p262 ff

Some aspects of design from the perspective of a woman designer

Sheila Levrant de Bretteville

Sheila Levrant de Bretteville is a young American woman designer who currently runs an architectural and design practice with her husband in Los Angeles. She is a graphic designer, teacher, critic, and mother to a three year old boy called Jason

Introduction

The design arts are public arts, and as such are major vehicles for forming our consciousness. Consciousness, in turn, is illuminated by communications, objects, buildings and environments. The design activity stands between us and our material existence, affecting not only our visual and physical environment but a sense of ourselves as well.

The process by which forms are made, and the forms themselves, embody values and standards of behaviour which affect large numbers of people and every aspect of our lives. For me, it has been this integral relationship between individual creativity and social responsibility that has drawn me to the design arts. It is possible and profitable to reinforce existing values through design. In my work, however, I try to project alternative values into society in the hope of creating a new, even utopian culture, by acting in accordance with values of my own choosing.

We can look at design and actually read its messages—thus we can locate, create and use positive modes which reject the repressive elements of dominant culture. I have been trying to use forms and processes which project and reassert aspects of society which—though of essential value—have been repressed, devalued and *restricted to women* in the private realm of the home.

As I become increasingly sensitive to those aspects of design which reinforce repressive attitudes and behaviour, I increasingly question the desirability of simplicity and clarity. The thrust to control almost inevitably operates through *simplification.* Control is undermined by ambiguity, choice and complexity, because subjective factors in the user become more effective and the user is invited to participate. *Participation undermines control.* The oversimplified, the unremittingly serious, the emphatically rational are the consistent attitudes associated with work adopted by major institutions and the men and few women who inhabit them. In the circle of cause and effect, these attitudes are reinforced and reproduced as they are visually and physically extended in our environment.

One means of simplification is to assign attributes to various groups and thereby reinforce divisions. The restriction of certain behaviour to the home and the making of women into the sole custodians of a range of human characteristics create a destructive imbalance. The design arts reinforce this imbalance by projecting the 'male' tone only in the public realm of our large institutions: business, science, the military and even education, valuing their anonymous, authoritarian aspects and separating themselves further and further from the private realm, thus continuing to isolate women, female experience and 'female' values.

Mass media and communications: a diagram of simplified separation

The mass media have a tradition of visual simplification in order to isolate their messages to attract attention. This simplification denies the complexity of life's experience. Simple statements, familiar and repeated imagery, sell the product and the idea most efficiently. They also reinforce restricting separations.

In advertising, women are described as, or permitted to be, laughing, crying, doubting, making mistakes, hesitating: women alone are seen as nurturing or as providing emotional support for children and men. When, for example, a company presents itself in a service capacity or as particularly accomodating, it uses a female figure and reinforces traditional attitudes by this symbolic imagery. The iconography for men is equally rigid. Men in work situations are shown as serious, decisive, professional, assured. No emotions, no fantasy; the few moments of relaxation or emotion permitted to men are relegated to leisure and the home. Likewise, the home becomes devalued as a place where no serious work can be done. As the woman is virtually seen only in the home, she too is devalued. By depicting women as exclusively emotional, doubting, cooperating and helping others, by only showing these activities in private, in the home, the polarities of what men and women are thought to be are reinforced and legitimized. In fact, the very characteristics which are allowed in women in the home, prevent success in the competitive public sector.

If the idea and the design are simple, complete and set, there is no opportunity to bring one's own values to the forms. If there is no ambiguity the eye is attracted once, the message understood and accepted quickly. When visual material is ambiguous the different nuances often encourage multiple and alternative reactions to the same communication. Were the mass media to include contradictions; were its images to contain suggestions rather than statements, the viewer could make an effort to bridge the gap, to interpolate, extrapolate, participate. But this is not the goal of mass media communication. Design as a problem-solving activity is assumed to involve only the acceptance by the designer of the aims of the client. If the client's goal is to sell a product or idea quickly, the problem does not include the encouragement of a thinking audience.

The modern movement in design encouraged a simplicity and clarity of form. This mode was embraced by some of the most creative and intelligent designers. It became fashionable to simplify for the clarity and power of the image, but as design becomes fashion, simplification becomes pernicious. This simplification in form and process leads to restricting and limiting separations and boundaries. By relaxing boundaries, by allowing more complexity in the image, designers could prevent this kind of visual fascism.

The reawakening of feminism has renewed the demand that the social expectations for both men and women be broadened, enabling all to participate freely in the social system according to the full range of their personalities, and allowing all individuals to create their behaviour from the whole spectrum of possibilities. Not only will we not know what immutable differences exist until expectations change, but the very values which are devalued and suppressed are consequently unavailable in viable form to both men and women. Designers could help to revalidate what have been designated as 'female' values and devalued as such.

Publications: some alternative modes

People aware of design and its responsibilities are developing a design activity based on an ideology which encourages the emergence of the direct voice of the individuals who compose society.

The movements of the sixties questioned the structures and institutions that engender conformity. Alternative modes began to be developed that pointed out the limitations of heirarchical, one-directional channels of communication. For example, modern offset printing technology has begun to be used to create a model for participatory politics. By compiling a catalogue of goods and services recommended by a large number of contributors across the country, *The Whole Earth Catalog* re-established the value of individual subjectivity and designed a structure that encouraged user participation. This effort, as well as others of the youth, hippie, human-potential, counter-culture movements, helped validate some repressed 'female' values, and encouraged the growth of the women's movement.

A similar attitude pervaded my design for a special publication for the International Design Conference in Aspen. Usually, six months after the conference, the participants receive a booklet containing excerpts of the speeches and comments by established and rising stars. Rather than impose my own understanding through this kind of control and simplification, I composed a newspaper of the direct voices of those participants who chose to record their experiences.

Cards were distributed on which any comments a participant might want to make could be written, drawn or typed. On the last night, these panels were glued together directly, forming pages. Then, throught the use of an inexpensive, quick, rotary form of offset lithography, the newspaper was available in the morning. The distribution and assemblage of standardized panels created a non-heirarchical organization. All spreads were virtually alike, not one dominated, and all invited the readers to participate through choosing which entries to read and in what order. It is the readers who must create and combine these fragmented responses into their own personal picture of the conference. It was the participants who chose the fragments, the reader who organized them individually. As a designer, I created the structure which facilitated this process. The visual form of this newspaper was not the result of an effort to use a new form; new material, or new technological process, nor to develop a new or personal style. The forms were developed first to accord with a social context, to help achieve by their existence, the standard of behaviour they reflected. The forms are the visual expression of an effort to project information in such a way as to emphasize alternative standards of behaviour, alternative modes of design.

An increasing number of periodicals have begun to have guest editors, guest designers—*Radical Software, Design Quarterly, Arts in Society,* and others. As in the structure of *The Whole Earth Catalog,* special issues of publications provide alternatives to the small authoritarian establishment and expand the number of sources of information.

For example, I edited and designed a special issue of *Arts in Society* about California Institute of the Arts, a new community of the arts. The schools of this new institute were to open in one year, and I tried to create a graphic model that would reflect the formation of an alternative learning situation. These schools were being created by men who had been successful in the cultural establishment and were now creating an institution by working out some other ideas and goals, among them those of the movements of the sixties. I wanted to devise a design which would project the concepts of a horizontal, person-centred community. Every design decision was made to reinforce these concepts through the form of the publication.

I chose several types of visual and textual material and organized them in waves of information.

Letters between the Provost and future faculty members were scattered throughout the magazine, as well as taped fragments of dean's meetings, memoranda, student applications. These were interspersed with photographs from television and newspapers which described the social context of the United States during the decade in which the institute was being planned.

The organization of the magazine purposefully avoided the presentation of information in a simple, clearly logical, linear manner.

Instead, it was diffuse and depended on repetition of similar content, similar forms, cycles, leitmotifs, in both the writing and the imagery.

Many aspects of the book had to be reconceptualized and reorganized. The traditional table of contents, and its position in the book was not an appropriate form for introducing material. I substituted an alphabetical index placed after the first signature which included each type of information to be encountered in the book. Throughout the magazine, the author is listed by name only, and in the index, in alphabetical order. This was done in an effort to avoid heirarchy and authority and to guide the reader to a different way of reading.

The tentativeness of fragmented organization encouraged the reader to participate in the ultimate conceptualization of the community. Since California Institute of the Arts was yet to open, and consequently, was not clearly defined, its character could, in some sense, be shaped by the individual reader's subjective response. I felt that it was possible to establish a real and dynamic relationship between the institute and a readership. The non-heirarchical, fragmented organization, the diffusion of formal elements had become attractive to me as a visual projection of alternative modes of relationship. Certainly it is an alternative to the method of projecting set, simplistic messages that distort communications in the mass media.

Projecting data in a clear, systematized manner is most sensible in the communication of certain types of information, such as maps and catalogues, but when it is used to communicate ideas or information about people and their relationships, it distorts. Designers are taught to reduce ideas to their essence, but in fact that process too often results in the reduction of the ideas to only one of their parts. A more diffused manner of organizing material maintains enough complexity, subtlety and ambiguity to entice the readers who normally dart away with someone else's encapsulated vision, rather than remaining long enough and openly enough with the idea to make it their own.

I invited students in my class at CalArts to investigate this form and process, using content that was personally meaningful to them.

I asked them to create a whole of their own. The whole was to be greater than the sum of the parts.

A woman student explained her solution;

"Its cryptic presence overshadows that of its ingredients.

We recognize these symbols in an understanding of their total symbology (or at the very least, in a resolution that they may be unified meaningfully) ...

Masculine hands describe, define, offer, repulse, threaten ...

the only feminine elements are solely and grotesquely sensual—bodies fulfilling a seemingly obligatory sexual role, and hair-do's delineating a faceless area, a non-existant identity ... It seems that many of the superficial accoutrements of a culture are present, and yet little of the whole human being is seen. Despite the constant sexual innuendo, despite the care given to the tools of a communicative sort ... despite the hands that gesticulate and promise or threaten ... there is no real touching ... the accoutrements, the parts have less graphic, linguistic and psychological importance than the whole."

As the community becomes used to ambiguity, complexity, subtlety in design and content, it will be more able to support the formation of individual conclusions, the expression of individual subjective opinions and will advocate the sharing of authority. For me this is a good, that Design can encourage.

The organization of material in fragments, multiple peaks rather than a single, climactic moment, has a quality and rhythm which may parallel women's ontological experience, particularly her experience of time. Although I came to use this fragmented organization in an effort to reflect a community of the arts in formation and to encourage the reader to participate, this form of visual organization corresponds more to a women's world.

There are several genres of women's work, quilts and blankets, for example, which are an assemblage of fragments generated whenever there is time, which are in both their method of creation as well as in their aesthetic form, visually organized into many centres. The quilting bee, as well as the quilt itself, is an example of the essentially non-heirarchical organization. Certainly the quality of time in a woman's life, particularly if she is not involved in the career thrust toward fame and fortune, is distinct from the quality of time experienced by men and women who are caught up in the progress of a career.

The linearity of time is foreign to the actual structure of a day as well as to the rhythm of women's monthly biological time. Thought processes released from the distortions of mechanical progress are complex, are laminated with myriad strings, are repetitive and permeated with the multiple needs of others as well as oneself.

Unbounded relationships cause most women to think not only about work, but about the groceries needed, dinner, a child's dental problems, etc, in between thoughts about work. Women's tasks in the home are equally varied and open-ended—child-rearing is the classic example—while a man's work in the home has a beginning and an end, it has specific projects, like the fixing of windows, appliances or plumbing.

The assemblage of fragments, the organization of forms in a complex matrix, projects this experience of time, suggests depth and intensity as an alternative to progress.

When the design arts are called upon to project aspects of the women's movements, it is particularly appropriate to challenge existent assumptions about form and process.

When I was asked by a group of women artists to design a special issue of *Everywoman,* a feminist newspaper, I tried to incorporate the visual projection of the egalitarian, collective form of the small group process. In weekly meetings, small groups of women throughout the country talk in turn so that those easily dissuaded from speaking by more vibrant, dominant personalities, are assured of being heard. In this *Everywoman* design I avoided the associations of space and length of article with quality, and gave each woman a large photo of herself and a two-page spread, regardless of the length of her copy. I tried to link the spreads visually and to make no spread dominant. Looking alike, the articles did not visually compete with each other for the reader's attention; it was left to the reader to discern differences which might be subjectively more meaningful. In addition, I encouraged the women artists to stay within the limits of the budget and printing process used by the ongoing publication, even though they had access to special funds.

It seemed that we could provide a more viable model if we did not inflate the object and participate in the existent attitude that whatever is technologically or financially possible must be made available—at least to a few.

Designing a structure that will encourage participating, non-heirarchical, non-authoritarian relationships between the designer and the user, also results in visual and physical forms that are outside the mainstream of design as much as these ideas and attitudes are outside mainstream culture.

The way these publications look is different from the way our national publications look: this difference is much less the result of creating another style of designing structures which encourage different values.

Desirable as it is that these values become diffused into society, such design structures are often modest in appearance, rather than powerful, elegant, simplified, clear and dynamic forms. Perhaps the importance of dynamic visual relations should be questioned and quiet, literary forms re-evaluated.

Design appears to be a particularly ambiguous enterprise—and design for social change, even more so—in comparison with the other arts. The designer is often paid by those very institutions which would be affected by her attitudes in forming and shaping design: the contradictions for a free-lance designer who wishes to effect social change is thus apparent. Because design is attached to the world of business and industry in this way, it is difficult to know in advance if one's design will be used to reinforce values that the designer opposes.

Designers must work in two ways. We must create visual and physical designs which project social forms but simultaneously we must create the social forms which will demand new visual and physical manifestations. Those designs of mine which I have discussed are the products of situations in which I was called upon to give physical form to efforts to create new social contexts. In this case, the major thrust was to rethink assumptions—profit was not a consideration and the budget was modest, and the audience (unfortunately) was limited.

In this way I was exempt from the pressures that make it difficult for a larger, money-making project.

But as such situations are rare and because I could no longer separate physical and social design, I found myself needing to create an interface.

I wanted to investigate the

possibility of working with other women. I allowed myself to indulge the notion that this method would locate problems and design solutions free of the design system in which both commercial stars and commercial hacks were always subject to the pecuniary ethos.

Further, without losing the social context implied in the activity of design, I had actively to erode the idea of design as a private activity.

It has always been the public nature and responsibility of design that I have believed definitive.

Accordingly, I initiated a *Women's Design Program* at California Institute of the Arts.

In this program I was able to explore the relationship between design and feminism. The personal and ideological involvement offered the opportunity of finding a sphere of action that allowed these values to survive. I wanted to give attention not so much to what could be produced as to an operative ethic.

That does not mean that we were not to design using concrete forms, but points to the need to protect these ideas from being buried under the subservient design process.

Working with communications, rather than object-making, made it easier to infuse a design with these attitudes.

It was clear to me that women designers could only locate and solve design problems in a responsive way if they simultaneously studied their own history, tried to isolate female values and worked cooperatively.

I designed procedures and projects which could reinforce the idea that design is a social activity and that women working in the design arts must have an understanding of the technical, as well as the social aspects of mass media technologies.

The design and printing of *Broadsheet 1* documented this investigation of design and feminism.

Several of the early projects recorded in *Broadsheet* seem, on the surface, to have primarily technical goals, but they incorporated other values.

Through the simple manipulating of bright red dots on a white ground, the women eased into an understanding of the simultaneous organization that allows people to see an image out of the dots and intervals in the half-tone process used in most publications.

They learned this in an atmosphere which was intentionally playful and unthreatening. In an effort to recover a personal connection with work, the women investigated typographic conventions using language which had strong meaning for them individually. Playing with these meanings, they manipulated the forms to construct their own interpretations of it.

Just as these two ostensibly technical exercises were necessarily based on social values and contents, so the project of creating a photo-essay on another woman in the program was designed to help each woman gain control of the photographic medium as well as to express a relationship between the photographer and the subject which reflected their growing understanding of each other.

I planned a group project for the *Women's Design Program:*

the problem was to be defined and explored in terms of our experiences as women, and the solution attempted as an ensemble.

As a result, I suggested that we should design a presentation of menstruation to girls. While we looked at material currently in use, the examination of our own experience was the real starting point for this group.

We found it necessary to create material which would provide an alternative to the films and brochures linking menstruation with uncleanliness and an incapacity for physical and emotional self-control, while the 'positive' aspects were linked to marriage and childbearing.

We videotaped our own discussions of this material and later, looking at videotapes of our talks, we were struck by the cogency of hearing about the variety of experience of menstruation in the context of real people's lives. We decided on this format as our design solution.

We invited groups to the studio and videotaped their discussions of menstruation, calling the project *Learning from Women's Experience.*

Technical proficiency was acquired in the process of making videotapes, as each woman had a turn at being director, assistant director, camerawoman, or in charge of sound, light, etc.

We taped young girls talking about the deficiency of information on menstruation, about their conflicts and questions. The talk ranged—some wanted to remain tomboys, others felt uncomfortable with the boys who had been their friends until this time, and many were confused about their capability to have children when they felt they were too young then or might never desire them. We tried videotaping discussions with males in the hope that including them in the talk would encourage integrated audiences where young boys and girls could engage in open discussion of their feelings after seeing the tape. But the tapes with both younger and older males were very strained by the difficulty they encountered in understanding this experience for which they had no analogy in their own lives, and from which they felt excluded, shameful, fearful and yet curious.

We taped a group of older women who reminisced about the conspiracy of silence on the subject and their female experiences, including the menopause. Their tape was the most exciting, not only because they generously shared their richness of longer lives, but because their open and honest exchange of experience illuminated the problem of menstruation as a continuum in women's lives.

Even in this project we had to wrestle with the linking of emotionality and women. When we learned from a woman doctor that there were psychological causes for the emotional intensity some of us experience before menstruation, our first judgement was that this emotional reaction was unfortunate. But soon we saw this as good—perhaps this menstrual state would not seem devient in a society which was not so committed to controlled rationality. In this project of designing educational material, we realized how important it is to provide an alternative to the presently available materials which oppose the devaluation of 'female' characteristics as an instrument in the unthinking discrimination against women.

We were also perhaps, obliquely, providing more emotional latitude for men.

The work of the *Women's Design Program* was, to some extent, a retreat from the public world of business and industry where most of the design activity takes place.

Our progress led me to realize how vulnerable women were to those values which coalesce to deny us, in even our most private sectors, an appreciation and an understanding of our femaleness. Originally, I had been sensitive to the relegation of 'female' values to the home, but now I saw that even in her most private house (her body), woman is not able to live openly and knowledgeably. I knew that to liberate the private self, we must understand and alter the public realm.

One way for design to alter the public realm is to develop images of the future which embody female values and can permeate our contemporary society. To do this successfully, we must know what forms most communicate the discrepancy between male and female values, devaluate femaleness, and cannot incorporate such modes as emotionality, complexity and supportive cooperation.

The rigid separation of work and leisure, attitudes and values, male and female—which we noted above, is reinforced by the tradition of simplification in the mass media and it also operates in product and environmental design.

A few new voices were raised in the sixties who appreciated, not only complexity and contradiction, but the value of participation in the popular vernacular. However, the connection and response to the multiplicity of human potential was lost as their attitude became style and fashion.

Physical environment

For at least two and one half centuries, progress has been measured by our ability to control our physical environment.

In this, the essence of scientific rationalism, the real properties of the world, are those which are certain and which can be measured and manipulated. In this view, the subjective world of feelings and other aspects of life not susceptible to mathematical measurements are considered separate and imperfect aspects of the human mind.

As we have noted before, these 'imperfect' aspects are designated as female.

Therefore, major institutions—the government, the military, industry—when projecting themselves in the form of physical environments, choose the most efficient forms to reinforce their authoritarian and anonymous nature. They cannot risk losing control by projecting values of intimacy, emotion and egalitarian relationships. The public houses they build for themselves (houses without family; without women; houses for work) are often physical environments which seem predicated on the absence of 'female' values. This point of view tends to separate our different activities, reinforcing boundaries which are different in content and use.

The reflective, rational facade of the curtain wall is a form often given to buildings in the serious world of business. The curtain wall, once intriguing as a sensuous, multi-faceted exterior, has now become rationalized and simplified into a symbol of the male-dominated corporations. By being wrapped in mirror glass, the metaphor of corporate secrecy is further reinforced.

A glass building arbitrarily imposes a physical form; a skin upon a structure, without acknowledging the integrity of its relationship, either to its content and program, or to the external elements.

Its counterpart in our social life is a society wherein a pseudo-rational surface is stiffly maintained, which often masks an intuitive, or even irrational core.

In these buildings, accidents and changes in structure or use are obscured by the enforcement of this undifferentiated, inward-looking skin. Changes in the structure or use which might create complexity or richness are systematically denied.

Not all working environments are totally authoritative, rational and/or alienating. There can be few consummately rational houses because there are fantasy homes. The problem, however, is that the work situation is asked to absorb all rationality and the home all fantasy. The polarities are clearly divided and create overload situations. Each fulfills a narrow standard. These types of building are symbolic of forms which have been distorted by our culture to reflect only certain needs and values. This limitation pervades every aspect of our social environment. In order to penetrate this rigid separation it seems necessary to expose the symbolic connotations of forms. It seems to me that we must discover the interactions, the ways in which the various causalities balance and reinforce each other to almost guarantee this as the end result. It is sad, but obvious, that the standards of behaviour which design projects are often interlaced with extraneous considerations of style and profit. Looking at our environment we must locate those forms which have been determined by this narrow range of values too often dedicated to progress, status and power.

The sleekness maintained as the image for both cars and women represents a refusal to connect appearance with essence. We have no way to know what they really are like, so masked are they by symbolic meanings external to themselves. Rather than present this reality, which becomes progressively more opaque and dishonest, we could create designs in which technology is used to make society and its visual and physical extensions more transparent without losing the richness offered by complexity and ambiguity. Neither women or cars are permitted to make reference to their actual selves. In most cars, for example, the body is formed in order to present a sleek exterior symbolic of external and unrelated values. External appearances in designs and in people need not always mask internal realities. This masking, in fact, trivializes the essence of the object by attempting to transform it into what it is not. To take the car, again as an example, the mechanical necessity to stiffen the shell need not be masked by hidden reinforcement. Instead of bracing hidden beneath, the material could simply be corrugated. To pursue this approach in the presentation of fashion for women would involve a serious change in social attitudes. Integrity in the use of materials is one way to project this standard of behaviour. But every solution dissolves when it becomes absolute, mandatory.

Even integrity is diminished when it becomes 'style' rather than a response to the specific needs of individuals and individual design problems. Some designers overdesign obviously functional objects, buildings and environments according to some fashion. Others, believing in technology's ability to make most designs possible, find it unnecessary, if not irrelevant, to make a design respond directly to the nature of materials, structure and/or function. Beyond the requirements of design individual designs can leave room for personal symbolic meanings.

The analytical design process establishes particular functions without reference to human needs which would create a synthesis. Similarly, commercial, industrial and residential areas are often separated from each other in much the same way that 'male' and 'female' values are isolated and disguised. Separations between the distinct, but not necessarily unrelated aspects of ourselves are reinforced by the national impetus toward suburbia. Bedroom communities, designed so that each home is separate from its neighbour, and built long distances from downtown business districts, even further separate the private home from the public realm of work. Correspondingly, within the home—the last refuge of warmth, contact and individuality and the designated place for the 'female' values of nurture and support—there is further physical detachment from a wide social ambience. By isolating the activities of the home from the activities of work, alternative modes of behaviour in each are prevented from emerging.

Within the home itself, similar separation of spaces designated for activities deemed appropriate to that space, also discourage overlapping modes of behaviour. The very categories—house and community—create our time and work. There even has grown up a repressive tradition of separating work within the home—cooking and laundering are to be done in solitary confinement, while the rest of the family enjoys leisure. The extremes of efficiency and clarity unfortunately, are expressed as separation, isolation—a separate room of the house.

But there is an alternative mode to be found by referring to an older tradition. Until a kind of burgher=consciousness set in in the 17th century, the American kitchen was also a scene of festivity, combining the preparation and serving of food with socializing. A multiplicity of possible activities satisfying a multiplicity of needs. There have been efforts to restore the integrated work/play, physical and temporal relationship found in early cooking areas. But so pervasive is this separation, that even those tract homes, where the fashion is (for the purpose of conservation of space) to somewhat integrate kitchen, dining and living areas, have not yet produced the integration of roles one would hope for.

Futures

An examination of contemporary life shows us the difficulty not only of achieving reform now, but of drastically changing the future. The imbalance we find in our mass media communications and in the physical environment pervades our visions of the future as well.

The Newtonian world machine is even further incorporated into most negative utopian visions. But then, a perfect, or radically different society has always been difficult to imagine. The inevitability of reproducing ourselves rather than a new society is avoided, even as one thinks of the values one wishes to project into the new world.

The tradition of utopia has been permeated with contradiction and timorousness. For example, the renaissance visions of pastoral Utopia which appear 'female' in tone, which are supportive, cooperative and gentle, are yet haunted by death. Similarly, Sir Thomas More was unable to openly criticize his contemporary society and consequently, used satire in juxtaposition to his vision, thus softening what could have been a more blatant and strident evaluation. Coincidentally, this element of satire allowed people to aspire towards the values which More was articulating by comparing their own society with his own invention. of Utopia.

While early utopian visions were pastoral, later ones were more mechanical, developing as they did in coordination with man's ability to control nature. By the twentieth century, control first of nature, then of man himself, is not only a possibility but to a large extent an actuality. The utopias are transformed from aspirations to predictions and warnings. Fourier was, perhaps, one of the few 19th century utopian thinkers who tried to envision social and physical structures which encouraged a variety of human response rather than building social forms which either eliminated certain behaviour patterns, or controlled them.

To warn society of what could become the inevitable outgrowths of contemporary patterns, Wells, Orwell and Huxley described negative visions of the future. The total restriction and control of people's behaviour in these anti-utopias represents a critique of existing society. The unique characters who oppose the social and political orders are rendered absolutely impotent and are eventually edited out of these fictional societies.

Systems that achieve reliability—as virtually all dysutopian systems do—through conditioning, cause people to be less than human. What dismays me is that the behaviours that are most frequently eliminated in these visions are those 'imperfect' characteristics that have been denoted as 'female', partially because they are not simple, limited and predictable. They imply choice, possibility and complexity which, as we have pointed out before, undermine control. These dysutopian visions warn of futures in which men and women are indistinguishable—they are all made in that narrowest definition of 'male'; These futures are peopled by the simplistic, rational, controlled, serious business men of mass media communications. The environment is as heirarchical, anonymous and alienating as our major institutions are becoming; We find a future projected from those behaviours that survive in the public realm of work, while the characteristics of the home and women are deleted. Although some large industries are attempting to humanize their systems through encounter and work groups (Volvo is abandoning the assembly line), the major fears of the future reflect a dehumanized bureaucracy which succeeds in eliminating from life's 'official business' all overtly personal, irrational and emotional elements which escape calculation.

It is the same technological despair in the face of an increasingly mechanized civilization that has caused some young designers to switch from designing objects and environments to making the future graphic. They often picture a mechanistic and alien future, dependent on a benevolent technology, where equal distribution of resources and information creates an objectless environment. In these visions of a cybernetic future, motivated by fear of the ramifications of technology, we could live without status-laden objects, keeping only small tools and souvenirs and be free of material oppression. Of course, these designers have found no way to achieve their positive visions without being dependent upon a super technology. It seems to me that it is defeating to identify technology as either devil or messiah. Once again, it is not the object or the technology which creates the future but these components which simultaneously project values imbedded in them. A scrutiny of these values and a consistent allegiance to those we consider human will help us create those communication objects, buildings, environments and technologies which serve our essential interests. Perhaps these same designer's are in despair, though seemingly capable of envisualizing a benificent technology, because they are not free from making simplistic divisions between male and female attributes and roles.

Even in their ultimate vision on a *Happy Island* woman is shown as unable to move into the future because she is physically limited by her ironing board, vacuum cleaner, etc. Technology, which liberates the male, continues to oppress the woman. In fact, technology and femaleness are seen as oppressing modes, but surely technological advances can help to integrate work and leisure, private and public, male and female, when attitudes toward the equal value of these can be established.
But almost every utopia seems to insist upon isolation and separation. I noticed, for example, the lack of physical environment in many of the futures men present.
The only reference to physical reality seems to develop from the growing manipulation of the physical environment rather than man's existence within it. To postulate technology and the environment as antagonists is to affect the human condition negatively. We live in a world where large, seemingly monolithic organizations move as viable and dominant personalities, directing their energies not only toward conquering nature, but more and more to the control of man; a metaphoric nicety—by making men we are eliminating man.

I would not reiterate these dire visions of the future if I did not believe that there were some realistic alternatives, and that these alternatives are somehow linked to the rediscovery and projection of female experience. There seems to be an intrinsic relationship between the communitarian aspects of the women's movement and fanciful human utopian visions. It seems to me that the integration of design and feminism has profound implications for the future and it is both the opportunity and the responsibility of women designers to use this realm so as to diffuse our values into present-day culture.

The Women's Design Program

California Institute of the Arts

As she indicated in her article, Sheila de Bretteville has been connected with the Women's Design Program *at the California Institute of the Arts. Because the work of this program seems to demonstrate an important attempt to embody feminist principles into a course of study, we publish a selection of work by some of its students*

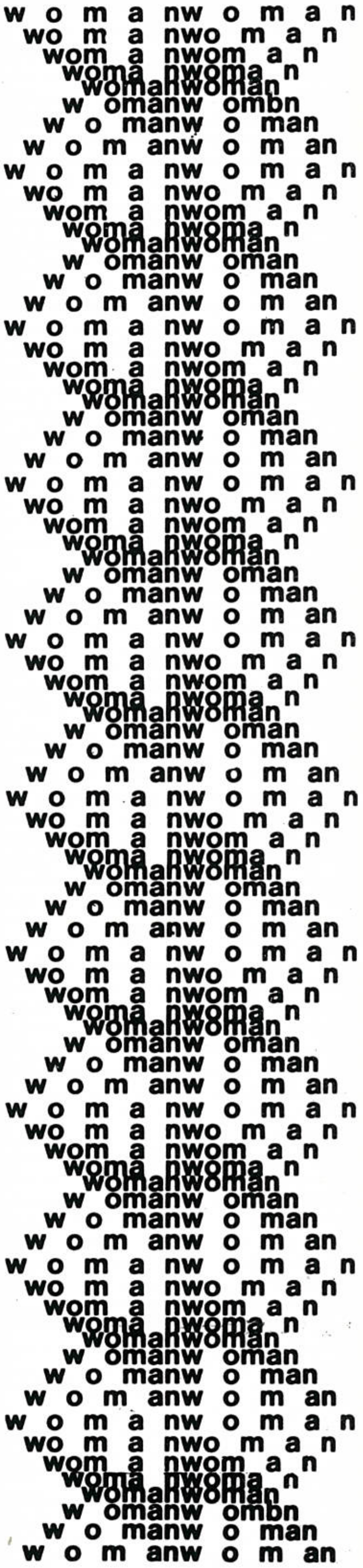
The following is a foreword from a broadsheet published by the *Women's Design Programme,* which sets out the aims of the study course.

"The Women's Design Program is our move to discover the design implications of the reawakening of feminism: to find new ways of presenting a perspective that is uniquely female, uniquely our own. We started with the fundamentals, with an investigation of ourselves through a sharing of our own experiences. We started at the beginning in design with a manipulation of dots and words—increments with which to construct a whole— a whole that could imply our values.

We have been asked if there is time to start at this beginning when such a strong demand exists to find immediate answers to problems larger than ourselves. Is there time to ask questions and re-examine values? We decided to create time: two full days a week to develop skills and to discover what, in fact, can emerge from a feminist design program.

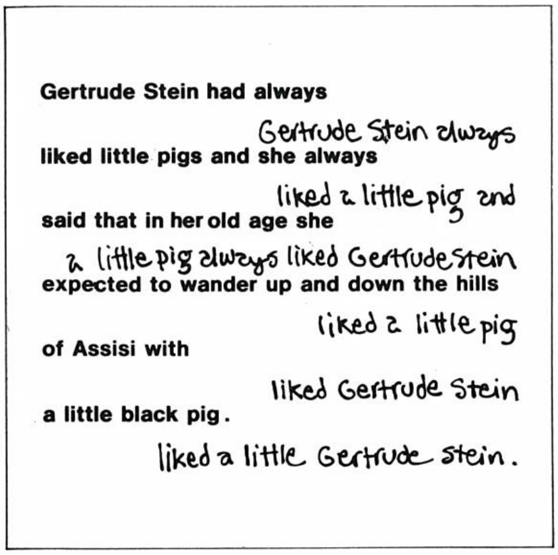
We want a freedom of choice, a variety of alternatives, and work which is personally absorbing and satisfying. Starting with ourselves, we have used our own experience as appropriate subject matter. We respect women as beings with individual thoughts, feelings and motivations. Liberation in part will come from thinking and working for ourselves, and not accepting domination or interference from without. This was the starting point for the Women's Design Program.

The program is one year long. It began with four sections.
In *Design Process* we developed criteria for the manipulation of primarily two-dimensional and typographical forms; and in the *Design Studio* we worked amongst each other so we could share suggestions about our ideas and work processes. We read and discussed a series of books covering many aspects of women's experience and heritage in the *Reading Seminar.* In the *Group Process* meetings we got to know each other, became increasingly direct and honest, and saw hair-raising, outrageous, and simply curious similarities in our lives. Separation into these parts was a means for a beginning: as we intended, the reading and group process increasingly fed into our design work. The parts became integrated."



Editorial note

The notes which accompany the works are those of the women design students.
They are included because they do much to explain the rationale of the Women's Design Program



Gertrude Stein had always

Gertrude Stein always

liked little pigs and she always

liked a little pig and

said that in her old age she

a little pig always liked Gertrude Stein

expected to wander up and down the hills

liked a little pig

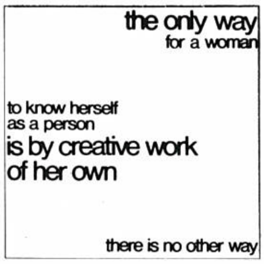
of Assisi with

liked Gertrude Stein

a little black pig.

liked a little Gertrude stein.

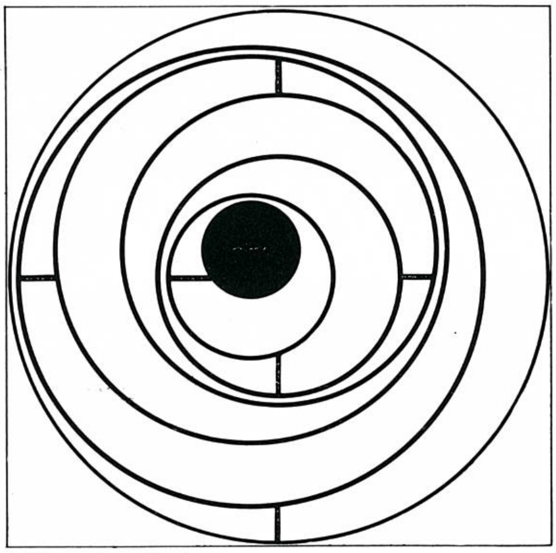
"First I deleted several words from the quote, trying to drop the sensible context of the sentence but keeping "Gertrude Stein," "always," and "little pig." It is always interesting the way Gertrude Stein always uses the word "always" as if nothing could be more obvious. Hopefully in keeping with the commentative quality of the original, such things arose as:
"Gertrude Stein had always liked little pigs and she always said that in her old age she expected a little pig," which implies that Gertrude Stein had never done anything but speak and think about a little pig.
However, it seemed that a lot of the peculiarity of the resulting perversions depended on their proximity to the original quote, thus making both appear more ridiculous. What is pictures is, in my interpretation, the meatiest part of the sentence juxtaposed with the original Gertrude Stein."

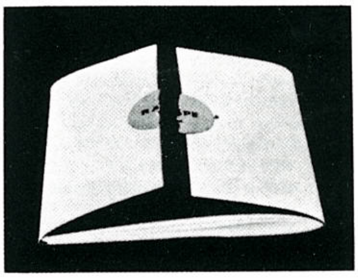


the only way
for a woman

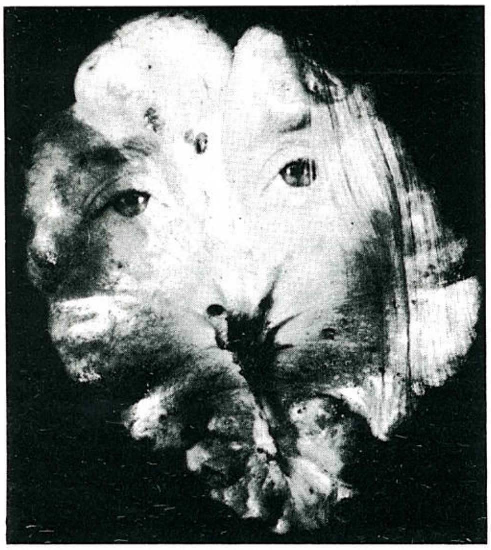
to know herself
as a person
is by creative work
of her own

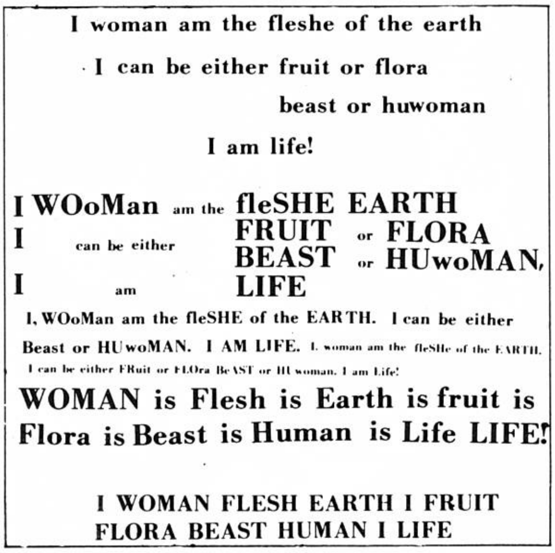
there is no other way





"When I first began designing the book, I felt intuitively that the form should be simple and clean.
The contradiction interested me—putting something as angry and ugly as rape on glossy white paper.
But this reason didn't justify the form of the book for me.
Then I began to see the book as an analogy for a woman who is in unity with herself when alone. The glossy white pages are her life—clean, untainted by assumptions and perceptions of women.
The intrusions are the black type, the constant recurring experiences which are forcibly placed in the center of each page, in the same way they intrude deeply into a woman's life. Each incident in itself may not be earthshattering, but the compilation of the incidents builds until by the end of the book, one should begin to understand a woman's perception of sexual intrusion. The cover is the completion of the analogy, the beautiful white cover which must be raped to be entered. The cover that will get dirty very quickly with handling. I want the reader to enter the book, enter forcibly, realize the way in which I feel my life constantly forcibly entered. I want him/her to enter into a woman's perception, and realize those ways in which women are raped both psychically and physically."





I woman am the fleshe of the earth
I can be either fruit or flora
beast or huwoman
I am life!

I WOoMan am the fleSHE EARTH
I can be either FRUIT or FLORA
BEAST or HUwoMAN,
I am LIFE

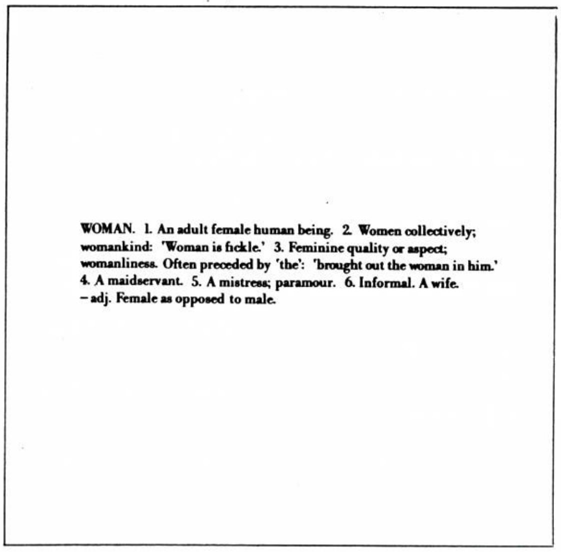
I, WOoMan am the fleSHE of the EARTH. I can be either Beast or HUwoMAN. I AM LIFE. I, woman am the fleSHe of the EARTH. I can be either FRuit or FLOra BeAST or HUwoman. I am Life!

WOMAN is Flesh is Earth is fruit is Flora is Beast is Human is Life LIFE!

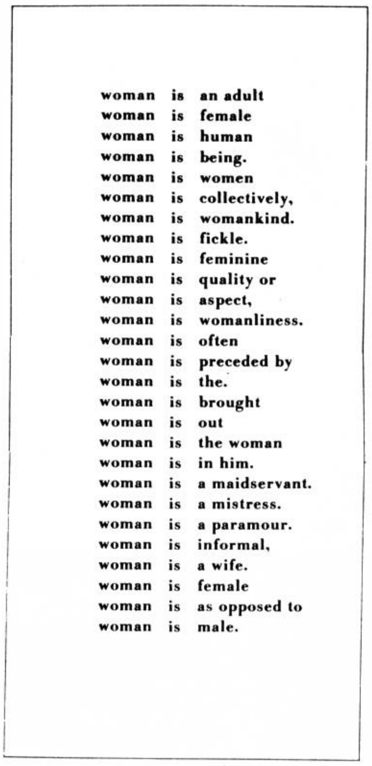
I WOMAN FLESH EARTH I FRUIT
FLORA BEAST HUMAN I LIFE

As previously mentioned, the notes which accompany the works are those of the women design students. They are included because they do much to explain the rationale of the program

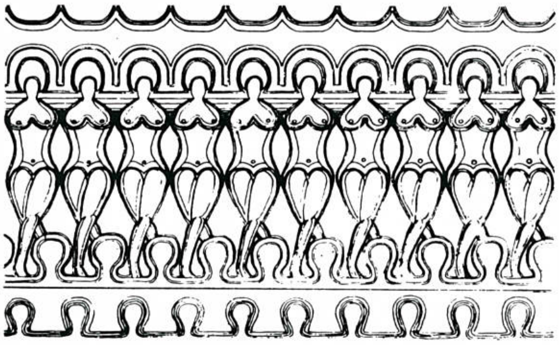
"One morning I came across the American Heritage Dictionary definition of the word 'woman.'
I was aroused immediately by the extraordinary examples they gave for common usage.
The first part of the problem was to set the type conventionally and try three different arrangements on a 10-inch square. I tried to do it as near the dictionary setting as possible without italics or the other devices used for emphasis or differentiation ... After two arrangements of the original setting, I began to change that information, leaving out the numbers and listing the descriptions another way, trying combinations of type in different weights and using only the most essential punctuation. I wanted to make a typographical rendering of the quotation that would show more of my own feelings about the text, arranging it in an arbitrary and almost nonsensical manner.
The last part of the exercise was to find some way of making an image equivalent to the words chosen. Unfortunately for the exercise, but fortunately for me, I became excited writing 'w's and 'o's and 'm's, which turned into chorus girls and made a handsome series of prints, but which had nothing at all to do with a dictionary definition of 'woman' "



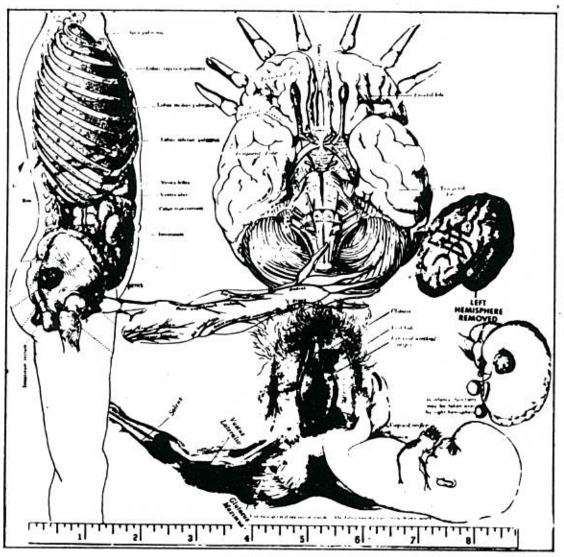
WOMAN. 1. An adult female human being. 2. Women collectively; womankind: 'Woman is fickle.' 3. Feminine quality or aspect; womanliness. Often preceded by 'the': 'brought out the woman in him.' 4. A maidservant. 5. A mistress; paramour. 6. Informal. A wife. – adj. Female as opposed to male.

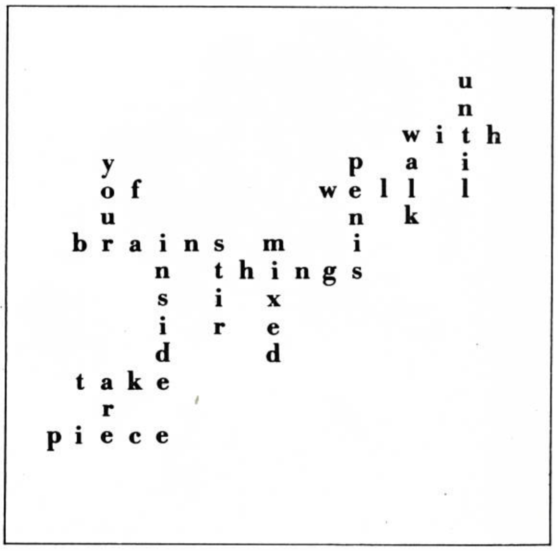


woman is an adult
woman is female
woman is human
woman is being.
woman is women
woman is collectively,
woman is womankind.
woman is fickle.
woman is feminine
woman is quality or
woman is aspect,
woman is womanliness.
woman is often
woman is preceded by
woman is the.
woman is brought
woman is out
woman is the woman
woman is in him.
woman is a maidservant.
woman is a mistress.
woman is a paramour.
woman is informal,
woman is a wife.
woman is female
woman is as opposed to
woman is male.



"I had no predetermined way of working with the arrangements of these words and images. I just sat down and a type of free association with them developed for eight hours. By arranging the separate parts of the quote, a form developed in which I could make relationships with the units in more than one way. I felt overwhelmingly depressed by the words and started to think about many experiences that led up to my abortion. Then I got out my collection of medical images which seems to be yet another way for me to know about my body. The final form these pictures took is hard to look at but in contemplating them, I still come up with new insights"




u
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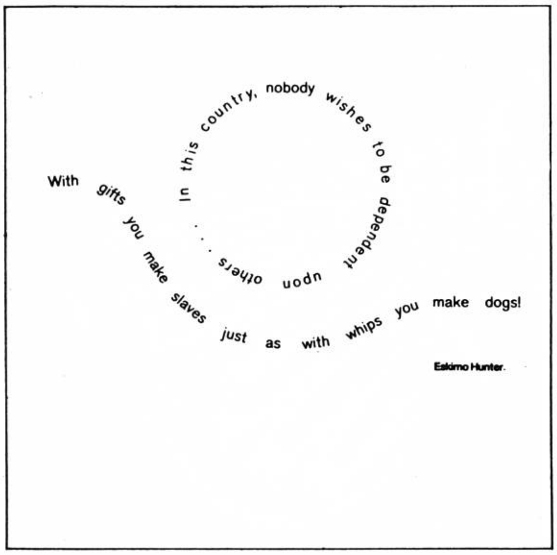
i r e
d d
t a k e
r
p i e c e

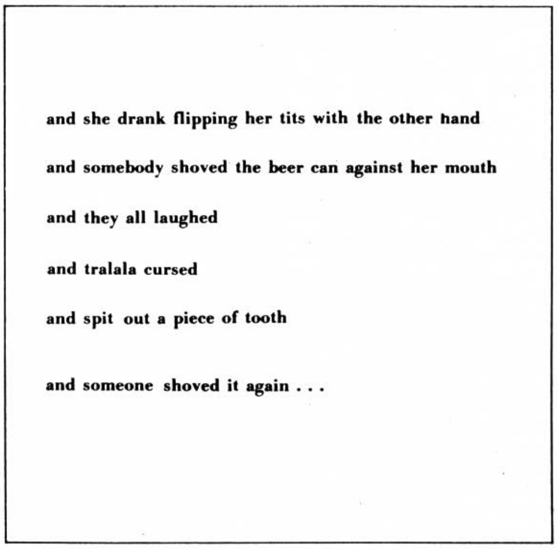
"In this design, I tried to emphasize the idea that the first line of the phrase speaks of dependency as a vicious cycle and that the second line is a metaphor describing the first line. (It reminded me of chivalry and other female 'gifts' which have served to keep women in their place for centuries). I made a circle of the first line and then curved the second line almost tangential to it. I thought the effect was as succinct and graceful as the words themselves"


In this country, nobody wishes to be dependent upon others . . .

With gifts you make slaves just as with whips you make dogs!

Eskimo Hunter.

"I chose the quote because it affected me profoundly.
I found that during the initial stages of the exercise, my visceral response to the overwhelming reality of the quote left me at a loss to really manipulate it. I tried listing the events which I felt would serve to understate that reality. I became intrigued with the isolated import of the verbs—this led me to a diagramming of all the sentences in which all the words could be seen apart from each other, each separately as horrific as the quote itself. Finally, when I could really objectively see the structure of the quote, I began to play with its meaning, to construct my own interpretation of it. It seemed that the objects were the real victims of violence not only from the faceless and nameless rapists, but from the identityless Tralala herself. Their vague personalities lost all importance in the last step.
The contact of intrusion or penetration became incidental.
It seemed that, in fact, no real contact or interaction existed—that the verbs and their objects were mutually exclusive. The process seemed clear to me; as a consequence I never worried about whether what I did was stupid or not, it just was.
However, the exercise never reached completion with an image or a typographical solution that would clearly communicate to others my interpretation of the quote.
I'd like to think I could really finish it"


and she drank flipping her tits with the other hand

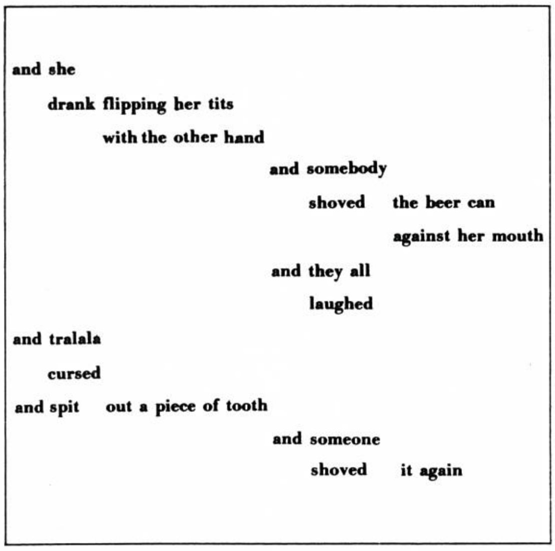
and somebody shoved the beer can against her mouth

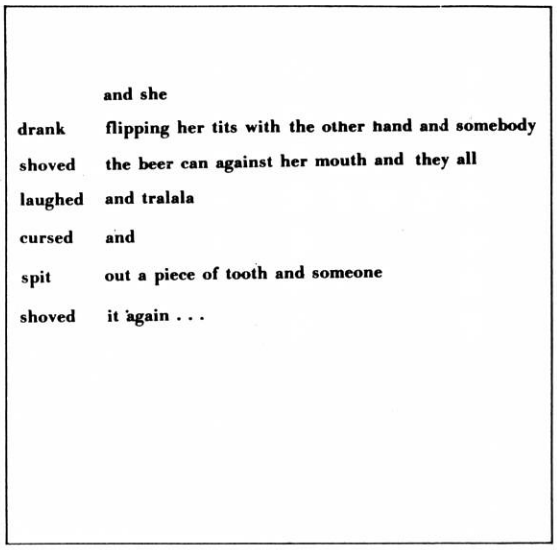
and they all laughed

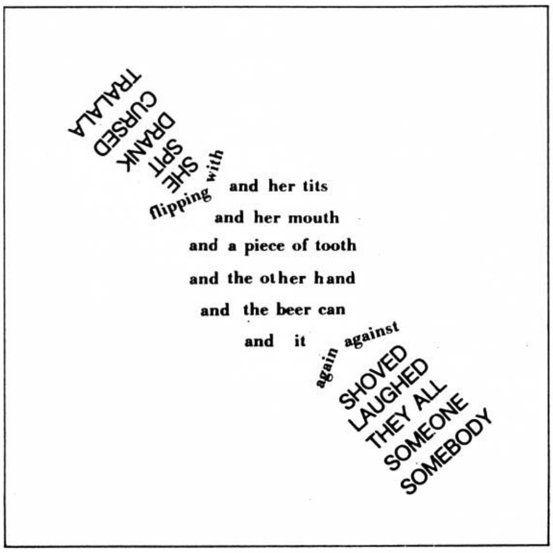
and tralala cursed

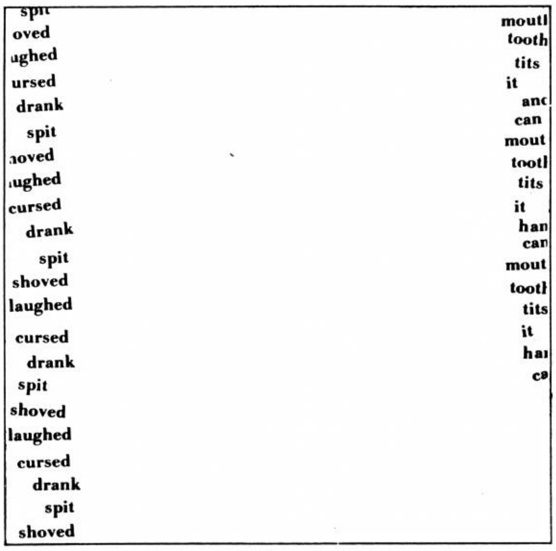
and spit out a piece of tooth

and someone shoved it again . . .


and she
drank flipping her tits
with the other hand
and somebody
shoved the beer can
against her mouth
and they all
laughed
and tralala
cursed
and spit out a piece of tooth
and someone
shoved it again


and she
drank flipping her tits with the other hand and somebody
shoved the beer can against her mouth and they all
laughed and tralala
cursed and
spit out a piece of tooth and someone
shoved it again . . .


TRALALA
CURSED
DRANK
SPIT
SHE
flipping with and her tits
and her mouth
and a piece of tooth
and the other hand
and the beer can
and it again against
SHOVED
LAUGHED
THEY ALL
SOMEONE
SOMEBODY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Alphanumeric symbols for mosaic printers and display tubes

J M Dirken, H van Campenhout,
W Crouwel, J L de Kroes et al

The joint author's of this report describe some recent work undertaken in the Department of Industrial Design and Electrical Engineering, Delft University of Technology, The Netherlands

1 The mosaic teleprinter

One of the most conspicuous devices in modern data systems is the teleprinter. Information is forwarded by the operator via a keyboard to the system concerned. The printer makes the information from the system readable. Present-day teleprinters are based on the principle of typewriting. The negative form of the required alphanumeric symbol presses an inkribbon against the paper, making an imprint. The approximately 100 symbols are present in life-size robust forms. Bringing the required symbol into the correct position in front of the paper is the main problem to be solved in the different executions. Even the most brilliant solutions to this problem have, however, the disadvantage that the printing speed remains rather limited and, furthermore, operating these printers at full speed is a rather noisy business.

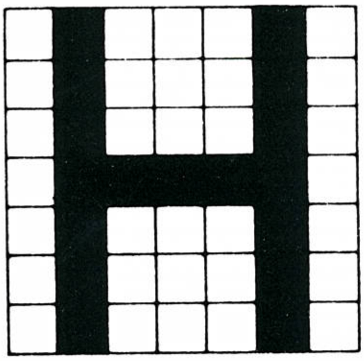

figure 1

The letter symbols are mostly restricted to either capitals or miniscules (upper and lower case) in order to ease the problems.
This fundamental limitation led to some research being carried out on printing principles as well as on printing processes.
This has resulted in an ever-increasing use of the mosaic principle.
Here the printed letter is divided gridwise into a number of square elements. Some of these elements are selected for printing (dark);
the others are left white (as shown in *figure 1).*

This principle is also used in wall=journals, plasma panels, grids of light-emitting diodes (LED) and cathode ray tubes (CRT).

The printing is carried out by styluses. One can distinguish between executions with:
a) one stylus,
b) a linear array of styluses, that prints columns of elements and
c) a two-dimensional array, that prints complete letters.

The execution chosen will depend upon the speed of the printing process and the required speed of the teleprinter.
A printing process with pressure=sensitive paper has been chosen (in this case the styluses are electro-magnetically driven pins) for the following reasons:
a) copies can be made, and are instantly available.
b) no other auxiliary material besides paper is necessary (eg. ribbon or ink supply).
c) printing is directly readable
d) the speed of the process is so high that column printing is sufficient.

Now variable symbol width, variable intersymbol space and interpositions —imprints between the true column positions—can be used, making new, more legible symbol forms possible.

In *figure 3* the printing head is shown. Electromagnets M drive the pins P against the pressure-sensitive paper, that darkens at the point of impact.

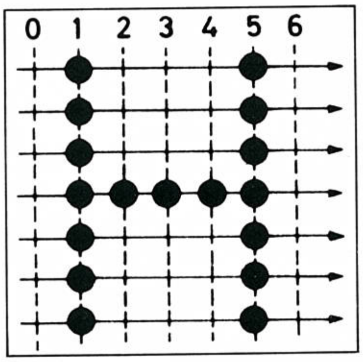

figure 2

After column 1 is printed, the head moves one position to the right to print column 2 as shown in *figure 2;* the dotted lines connect elements printed simultaneously; the time distance between columns is approximately 5 milliseconds;
the distance between the elements is 0.35 millimeters.
The shape of the symbol is recorded in typewriting in the life-size form, whereas in mosaic printing this information is stored in an electronic character generator, a small and inexpensive read-only memory, made as a large scale integrated circuit (LSI) in the metal-oxide silicon field-effect transistor techniques (MOS-FET).
Figure 4 shows a block diagram of the teleprinter.
The SPC presents the characters coded in the *International Telegraph Alphabet No 5 (ITA5)* in parallel to the CG.
With CS in position 1, the information for the first column is read out and presented to the 7 magnets M.
After the printing of the first column, CS is switched to the position 2, and the information for the second column is read out, and thus the cycle continues.

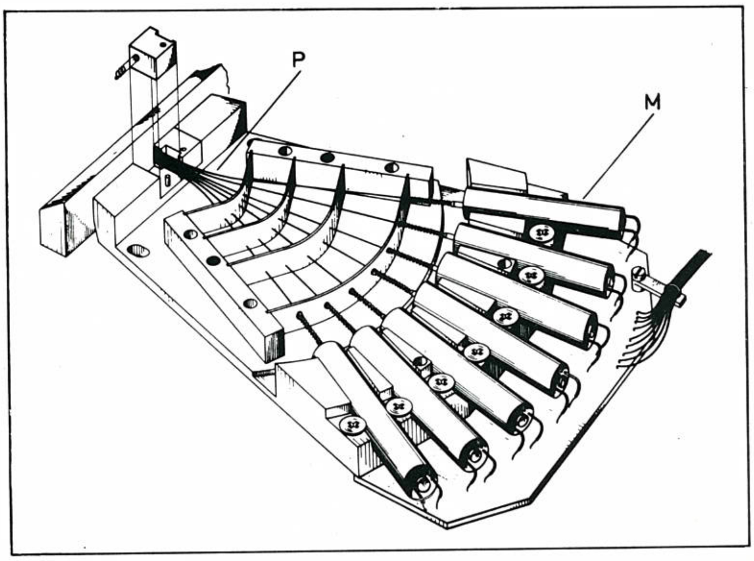

figure 3 Printing head of a mosaic printer

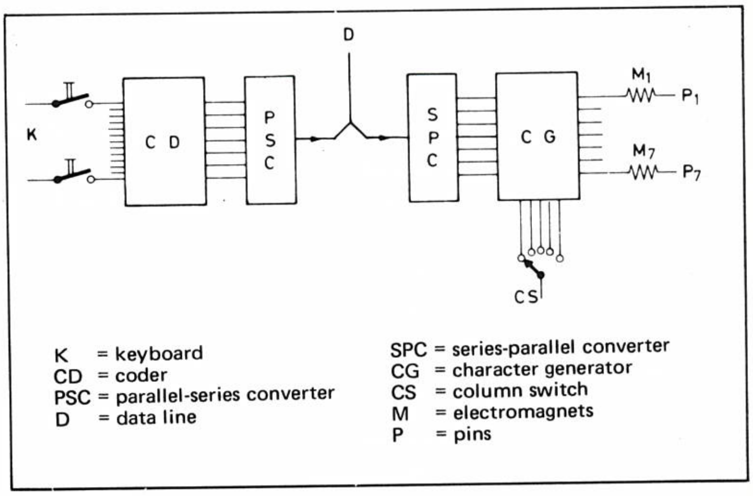

figure 4 Block diagram of the mosaic teleprinter

2 New applications

The mosaic teleprinter may find a much wider application than the traditional one.
Its advantages would seem to be as follows:
1
As the noise is much less and as both capitals and lower case can easily be provided by extension of the electronic character generator, a combined use as electric-typewriter and teleprinter is feasible.
Also the expected low price will make this possible. This can have far=reachning consequences:
Office typewriters may no longer be used independently but may be connected to a computer, maintaining a central archive on magnetic tapes, storing seldom used symbols in a central read-only memory, editing (eg. varying interword space to fill out the lines).
2
The interpositions—forming an extension of the mosaic principle—

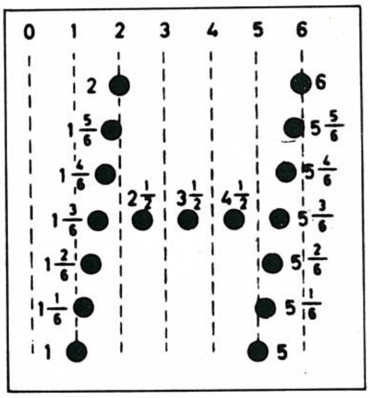

figure 5 An italic formed by using interpositions

icographic 6, 1973

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Departments of Industrial Design
and Electrical Engineering,
Delft University of Technology,
The Netherlands

make italics possible *(see figure 5).*

3

The most revolutionary usage will be that as a facsimile receiver, printing drawings, graphs, handwriting, signatures, foreign letters.
It differs from existing facsimile devices in that it prints 7 lines at once instead of one at a time.
The definition of 3 lines per mm is in most cases sufficient.
An extension to the *ITA5* code has been devised so that shifts to and from the facsimile-mode can be made when required.
Computer systems can now print graphs between the alphanumeric output and in many cases a plotter can be omitted.
Telegrams can now include drawings, letterheading and signature.
During the night hours news can be homeprinted.

3 Legibility of dot alphabets

Reading means sampling by the eyes in a jump-like way of a meaningful context.
The graphic carriers of information contribute less to this process than does the intended meaning of the text, and the comprehension and attention of the reader.
Concerning these three successive aspects: markers, meaning, comprehension, the main factor determining the first one is 'discriminability'.
Regarding meaning and comprehension, the dominant role can be named 'comprehensibility'.
Either of these concepts requires a distinct approach and special methods of legibility testing.

For the design of a new, or the choice of an existing alphabet and layout, four questions related to functional specifications should be answered:
—which semantic function applies?: (1) body texts, or (2) quantitative indications or (3) short, single words. Demands may be lowered in the case of body text in view of more redundancy and of less time stress.
—which display situation applies?: reading distance, book, journal, traffic sign, indication on a machine or vehicle, vibrating telex or disfiguring display tubes, etc.
—which reader's qualities apply?: everybody, meaning a 'healthy average person', school children, elderly people, people in a hurry, disinterested people, etc.
—which subjective preferences should be taken into account?: aesthetical ones, such as typographical style similarities, expression by means of special types and layout.

The most probable specification for the mosaic printer is as follows: body text and quantitative indications, reading distance (as with a book, between 30-50cm), a healthy average reader and no important subjective preferences.

In the dot alphabet continuous lines of symbol forms are approximated. The process of generating transmitting, remembering and reading become easier for the machine as the grid becomes less fine but, from the human reader, more visual integration is required.
In this suboptimal reading situation discriminability deserves extra attention, not only regarding graphic form and size, but also secondary factors such as illumination, contour, contrast and layout.
A realization on paper implies other demands than those for electrical display tubes. But research in this field is rather scarce (Schurtleff 1970; Huddleston 1971; Radl and Schubert 1971; Vartabedian 1971).

4 Some graphic principles

If one bypasses display characteristics proper, such as contour and brightness contrast, the design of dot alphabets mainly depends on the following factors:

1

completeness of the alphabet: upper and lower case, arabic numerals, additional symbols, together numbering 90 or more.

2

symbol width varying or constant, maximum height of the symbol grid.

3

form of dot and its size in comparison to the cell of the grid.

4

location of dots in the grid.

5

interletter and interword spaces and interline (leading).

Most current dot alphabets (Bell system, Philips, etc.) are restricted to numerals and upper case and show a constant character width. Lower case, however, is more legible for words and certainly for body text, and consequently the number of symbols should be extended from about 45 to 90.

A varying symbol width is the first requirement for discriminability.
The number of vertical cells proves to be very critical for lower case, because of ascenders and descenders, punctuation and accents; if the so-called x-height should remain constant, only one cell is available for either ascender or descender in the case of a grid 7 cells high; a varying x-height, however, proves not to distort the visual point of gravity in a line.
For lower case a height of 7 cells seems to be the minimum (see *figure 6).*
Discriminability is aided by maximum size of the form elements in comparison to the size of the cell, in the sense that horizontal and vertical lines are formed by uninterrupted rows of dots.

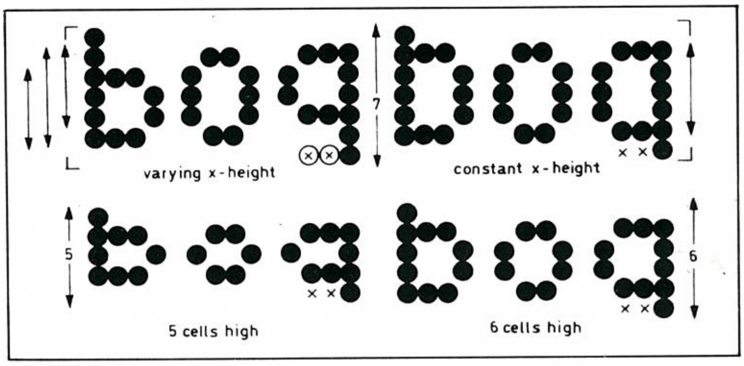


figure 6 Varying versus constant x-height; grids of 5 and 6 cells high. Words in lower case: boq *or* bog

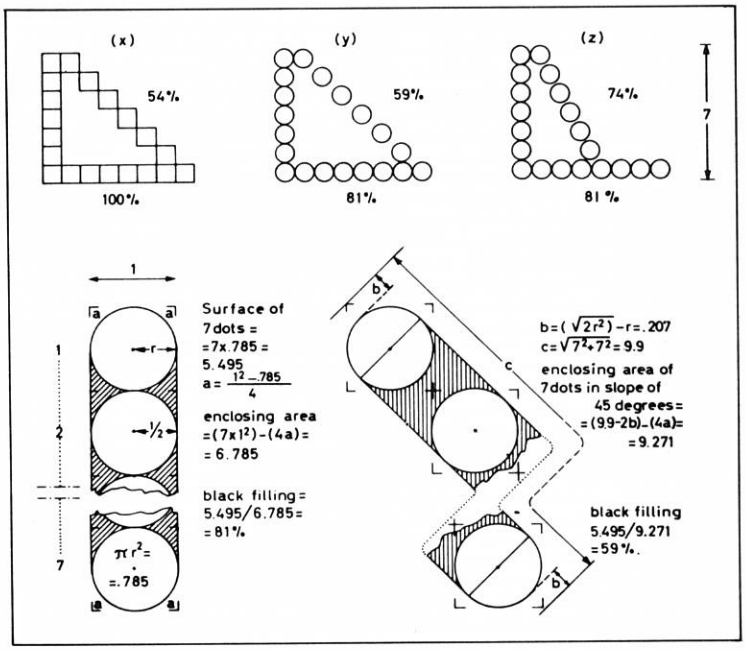

(x)
54%
100%
(y)
59%
81%
(z)
74%
81 %
7
1
a
r
½
2
7
Surface of 7dots = =7x.785 = 5.495
a = (1² − .785)/4
enclosing area =(7x1²)−(4a)= = 6.785
black filling= 5.495/6.785= =81%
πr²= =.785
b
c
b=(√2r²)−r=.207
c=√7²+7²=9.9
enclosing area of 7dots in slope of 45 degrees= =(9.9−2b)−(4a)= =9.271
black filling 5.495/9.271 =59%

figure 7 Different forms of dots and slopes; comparison between horizontal-vertical lines and oblique lines regarding 'black filling'

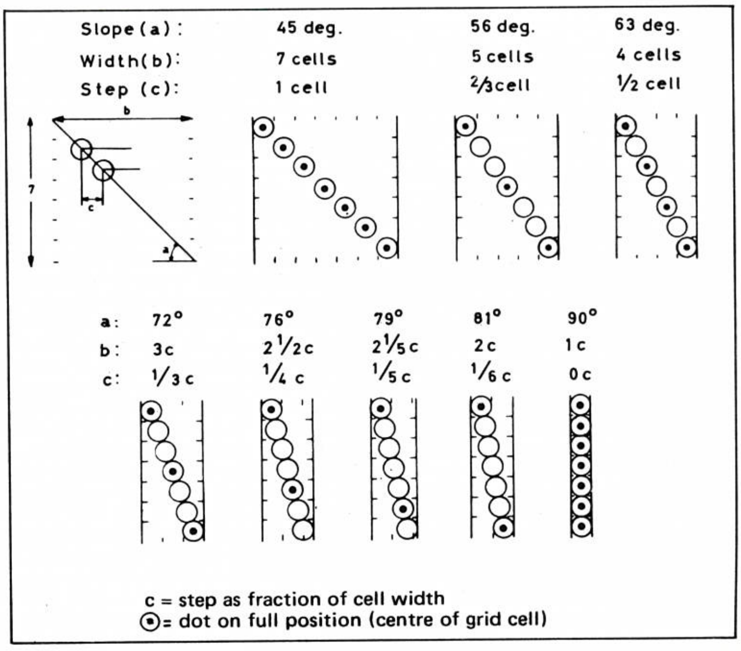

Slope (a): 45 deg. 56 deg. 63 deg.
Width(b): 7 cells 5 cells 4 cells
Step (c): 1 cell ⅔cell ½ cell
b
c
a
7
a: 72° 76° 79° 81° 90°
b: 3c 2½c 2⅕c 2c 1c
c: ⅓c ¼c ⅕c ⅙c 0c
c = step as fraction of cell width
⊙= dot on full position (centre of grid cell)

figure 8 Different horizontal steps and corresponding intermediate positions of dots.
(height of grid = 7 cells)

The form of the dots becomes especially critical when oblique lines are to be compared with vertical and horizontal ones. If the dots are squares coinciding with the cells, 'black filling' in horizontal-vertical lines versus oblique lines is 100% against 54%; if the dots are circles, these values become 81% and 59%, giving a better visual balance (see *figure 7)*.

The visual integration of dot symbols is considerably enhanced if circles are also located in positions other than in the centre of the grid cells. With mosaic printing it is possible to allow for intermediate positions of dots in the horizontal direction.
In *figures 7 and 8* the steeper slopes of lines are presented, which can be obtained by increasingly narrower horizontal steps.
Technically, even the division of a cell into 6 equal parts can be realized (see *figure 8)*. In particular, slopes with steps in the horizontal direction of two-thirds, one-half and one-third of the normal width should be considered for use. Finer steps show little visual gain and much technical complication. With 1/2 steps the black filling of oblique versus horizontal and vartical lines is 74% against 81% as indicated (z) in *figure 7*. Intermediate positions of dots yield rounder, more balanced forms and greater flexibility in designing.

Interletter space should be designed as a property of each symbol at both sides. Five different types of edges of symbols should be taken into account as far as possible: 1,>,<,/ and \; and their interactions; >'> (bx), /< (Va), <\ (cw), etc. After this space has been programmed, the so-called gross visual density (gvd) can be calculated for each symbol. This gvd can be defined as the total number of dots of the symbol, divided by the number of grid cells of the most narrowly enclosing rectangle, including the interletter spaces at both sides.
This can be expressed as a percentage, in our case varying—as will be seen—between 25% and 65% for letters.
The mean and variance of gvd values of an alphabet can be calculated and, where appropriate, corrected on the basis of the different usage frequencies of symbols in written language.

5 Technical solutions of coding, generating characters and control of printing

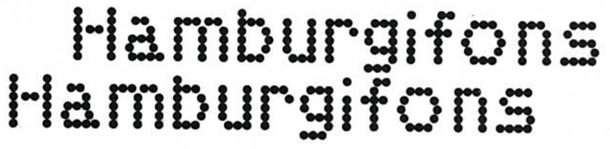
The symbols are coded in the *International Telegraph Alphabet No 5 (ITA5)* standardized by ISO and CCITT, as this code offers extended properties, in particular when using upper and lower case. The code is composed of 7 information units (bits) and in general includes an additional parity-unit to allow protection against errors.

After receipt of a character by the teleprinter, the *ITA5* code has to be translated into the form of information by which the solenoids can be driven, by means of a character generator (CG) (see also *figure 4)*. There are already CG's in LSI available commercially for mosaic alphabets on a 5x7 grid.
The alphabets described in this paper, however, need more information capacity and more output signals than the above-mentioned CG's. Any increase in costs, resulting from the foregoing, in regard to theCG in LSI is expected to be very slight.
For the purpose of comparing different alphabets, however, it is necessary to have texts, which have been produced by the mosaic printer itself. This requires a CG in which the form information is variable rather than permanently stored, such as in the case of an LSI circuit. Consequently, it is possible to modify the form of the letters and, by means of the same apparatus, to produce identical texts from different shaped alphabets.

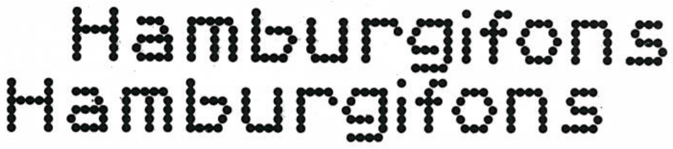
In our case a core memory with 2048 words of 8 bits was used as a variable CG. With the 7 information bits of *ITA5* it is possible to address 128 memory cells where the form information of each symbol can be stored. This information indicates for each printmagnet M1 up to M7, whether a print must follow and, if so, in which position.
The information for every column is coded in 2 memory words: a1 up to a7 and b1 up to b7 (see *figure 9)*.

The form information of each alphanumeric symbol is brought into the core memory beforehand by means of 8 bits papertape. The two sets of words of column information are punched into the so-called symbol tape according to the designed symbol form, taking into account that the eighth bit on each row used for the form information is taken as "1". Each group of form information is preceded by the seven information bits of the symbol in the *ITA5* code, whilst the eighth bit of this row on the papertape is taken as "0", as distinct from the form information. In the "write" position the core memory is loaded with the contents of the symbol tape by means of a paper-tape reader. The *ITA5* code, marked with an ")" in the eighth bit position always yields the address of the memory cell. In the "read" position, the text that has to be produced can be presented by means of a so-called text-tape in *ITA5* code. Each sign in the tape serves in the memory as an address for the memory cell where the form information has been stored. Just as in the case of the LSI character generator, under the control of the mosaic printer, the column information has been given to the control circuit, now means of an electronically controlled stepping motor. One step of the motor moves the print-head over one column distance (0.35mm).
In order to print in position 1, the relevant magnets are operated immediately, and in position 2 and position 3 with proportional delays.

column information bits for print-magnet M_i		b_i	a_i
no print		0	0
print on the grid	(position 1)	0	1
print shifted 1/3 step	(position 2)	1	0
print shifted 1/2 step	(position 3)	1	1



above, Delft 1/3 alphabet
below, Delft 1/2 alphabet



gross visual density %	lower case 1/3	lower case 1/2	upper case 1/3	upper case 1/2
25-29	-	1	1	-
30-34	1	2	4	6
35-39	4	12	9	5
40-44	13	10	7	10
45-49	6	3	2	3
50-54	2	-	2	3
55-59	-	-	-	-
60-64	-	-	1	-
arithmetic mean:	41	37	38	38
standard deviation:	4.48	4.55	11.48	7.06

6 Specimens of designed alphabets

After some experimentation, two complete Roman (not italic) dot alphabets were designed in a grid of maximum height of seven cells and of varying width.
In one alphabet use was made of a three-part division (Delft 1/3 alphabet); in the second alphabet of a two-part division (Delft 1/2 alphabet).
In both cases, however, the distance between two adjacent dots in the same row has to be at least the same as the width of one cell, owing to the limitation of the printing mechanism. In the case of the Delft 1/3 alphabet it is possible to develop steeper slopes, better roundings and, consequently, a more pronounced typographical style.

The Delft 1/2 alphabet shows a characteristic hexagonal pattern, uses a varying x-height in lower case in favour of ascenders and descenders and was aimed at a maximum discriminability.

The gross width of the symbols in these alphabets varies respectively from 2 to 10 cells and from 2 to 9 cells, the average values for lower case letters being 4.77 and 5.32 and in upper case letters 5.58 and 5.57, respectively. For letters in each alphabet the distribution of gross visual densities (gvd) is shown in *figure 11*.

Both alphabets show a great similarity in regard to capital letters; the lower case letters of the Delft 1/3 alphabet prove to be more compact. In both cases the average lower case letter is denser.
If the usage frequency of the symbol in printed language is taken into consideration, the mean values of lower case become 45.3% and 40.9%, respectively, maintaining the same ratio.

7 Testing the legibility

During the design of both alphabets superficial testing of discriminability took place. Systematic comparisons and modifying distance and vagueness, however, are definitely insufficient. Therefore a program of testing was developed, but was not carried out, as this would necessitate having symbols and texts available, which were produced by the mosaic-printer itself. The mosaic-printer, however, can only be programmed after the design of the alphabets has been completed.

The program concerning the discriminability of single symbols comprises the measurement of minimum time, minimum illumination and maximum vagueness of recognizing 5 separate symbols from lower case, capitals, numerals and additional marks of both our alphabets, and also of a traditional dot alphabet and typewriter alphabet (3x5x3x4 testing items). A similar procedure should be followed with regard to (1) groups of numerals (2) nonsense words and (3) real words, the percentage of recognized symbols being the score. The time it takes to read aloud a standard text should suffice for comprehensibility. A limited number of subjects of three different adult educational levels should undergo many parts of this program in random order.

It is our intention to carry out this program in the near future and to publish the results, together with some more principles concerning the design, display and legibility of dot alphabets in general, the use of which seems to be increasing rapidly and should, consequently, be guided ergonomically.

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LoCoS—an experimental pictorial language

Yukio Ota

icographic 6, 1973

Yukio Ota is a Japanese graphic designer who has spent a number of years in developing an experimental pictorial language. In this short article he explains the general principles upon which it operates

My studies in Italy, which occurred some years ago, gave me an opportunity to attack the origin of "communication."
It not only indicated the difference in languages as a fact, but it forced me to understand the cultural system that Italy has as a whole.

In my notes at that time which cover several hundred pages, I can see myself worrying over the simplest question of what I could and should do in order to cope with the contradictions in present-day society.
In the notes, I thoroughly discussed the introduction of the viewpoint that modern times should learn from history, ie. innumerable predecessors, as well as the meaning and significance of absorbing into modern times the cultural heritage called classics.

Still vivid in my mind is the extreme joy I felt when I actually ascertained that this new outlook on the historical problem of human alienation, from the aspect of visual transmission can be fixed through the designing of a sort of visual word, beginning with the combination of dots and lines, and when I wrote down this conviction in my notes.

That I took up the *Divine Comedy* of Dante in its original language as the subject matter was because it is said that the modern Italian language began with the *Divine Comedy.* Whereas study of the Italian language and understanding of the cultural system called Christianity carried considerable weight here, the focus of interest was on the study of visual words as seen in established words.

At the same time, there was the feeling of wanting to utilize the features of the Japanese hieroglyphs called *kanji* (Chinese characters), which I had known since I was a child, and they served as the basis for designing LoCoS.

LoCoS, which is like "logos," is an abbreviation of *Lovers Communication System.*
It is only a temporary name, but I feel that it fills practically all the conditions necessary for a word revolution, which will make possible "mutual communication" in the future and that it summarizes the history of "communicating" man.

1
The contents can be immediately and easily understood as a whole.
2
The construction is systematic.
3
It is a one sound—one word system.
4
Spelling and pronunciation coincide.
5
The picture elements which make up one word are small in number.
6
It is easy to recognize the word forms.
7
Writing is simple.
8
The voice and word can be mutually interchanged.
9
Only a small number of word elements is needed.
10
It can be read and written easily by both human beings and machines.

What is particularly important is that it is easily understandable on an international basis.
It is a combination of form, sound and expression. Has there been any language in the past which has effectively combined these three elements? In other words, according to the LoCoS system, one can immediately understand the meaning if one sees the form.
At the same time, one can pronounce the sound, and on the other hand, if one hears the sound, one can indicate it in form and immediately understand the meaning.
Its application to a man-machine system is very easy.

The composition elements or "picture elements" of LoCoS are made up of 18 simple geometric forms, and words are formed through various combinations of these elements, which can be understood by everyone.
Each picture element is given a consonant, while vowels are given to the position and direction of the picture element, thereby forming the basic structure of pronunciation.
Sentences are placed inside squares piled three in a row.
The main part is placed in the centre row from left to right, while the adverbs are placed in the top row and the adjective "marks" in the bottom row, thereby making it visually easy to understand the meaning of the contents.
Since the part of speech and importance of a word differ according to the position in which it is placed, a reduction in the number of words becomes possible, as well as abundant expression in sentences.

An Italian friend, who has been travelling around the world for the past seven years, wrote as follows in a letter to me from Singapore:

"We need quickly everything for understanding each other in the world, in this terrible world, in this terrible age.
Tomorrow may be too late ..."

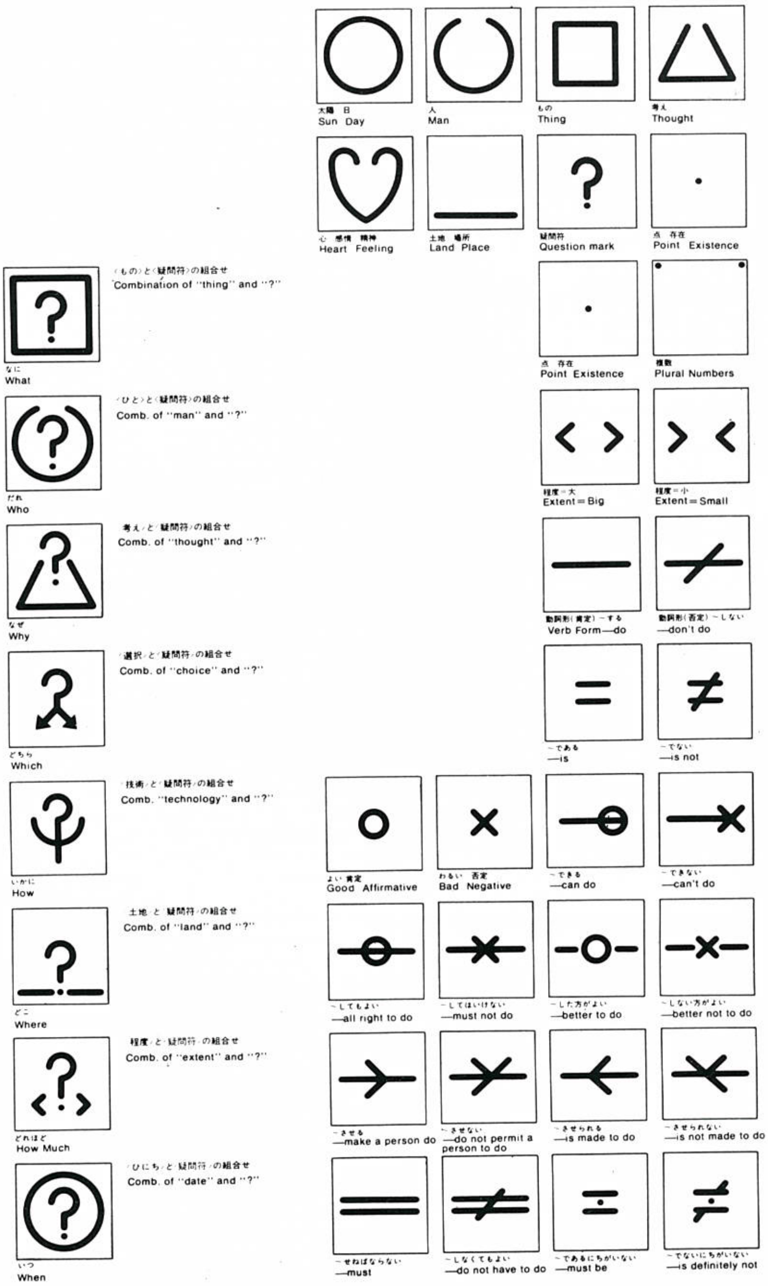
I believe that the need has grown bigger for us to grasp the "communication" action as something that belongs to us.
If the argument is summarized from such a standpoint, "communication" becomes "mutual communication"

LoCoS words are formed through the combination of 18 picture elements.
The meaning of words can be understood just by looking at them.
The form that serves as the base is given a basic meaning and complex meanings come from this base

and then becomes our "new weapon" through attaining the level of "mutual understanding"—this can be called the purpose of designing LoCoS.

When I was given the opportunity to announce LoCoS in Germany several years ago, I was able to write a thesis about the length of this article in LoCoS.
Since then, I have made partial announcements in the *Japan Design Society*, but in order to promote this idea in the future, it must not be restricted to personal grandstand playing, or to a small number of designers, and teamwork by wide=scope cooperators is needed.

I am intending to produce a LoCoS dictionary and explanatory book and, eventually, an encyclopedia in LoCoS, but prior to that, I am personally forming a group of people with similar interests in order to carry out wide studies and applications among people with different languages.
I would be very happy to hear from interested readers through the editorial office of *icographic.*


太陽 日
Sun Day
人
Man
もの
Thing
考え
Thought
心 感情 精神
Heart Feeling
土地 場所
Land Place
疑問符
Question mark
点 存在
Point Existence
〈もの〉と〈疑問符〉の組合せ
Combination of "thing" and "?"
なに
What
点 存在
Point Existence
複数
Plural Numbers
〈ひと〉と〈疑問符〉の組合せ
Comb. of "man" and "?"
だれ
Who
程度＝大
Extent = Big
程度＝小
Extent = Small
〈考え〉と〈疑問符〉の組合せ
Comb. of "thought" and "?"
なぜ
Why
動詞形(肯定) ～する
Verb Form—do
動詞形(否定) ～しない
—don't do
〈選択〉と〈疑問符〉の組合せ
Comb. of "choice" and "?"
どちら
Which
～である
—is
～でない
—is not
〈技術〉と〈疑問符〉の組合せ
Comb. "technology" and "?"
いかに
How
よい 肯定
Good Affirmative
わるい 否定
Bad Negative
～できる
—can do
～できない
—can't do
〈土地〉と〈疑問符〉の組合せ
Comb. of "land" and "?"
どこ
Where
～してもよい
—all right to do
～してはいけない
—must not do
～した方がよい
—better to do
～しない方がよい
—better not to do
〈程度〉と〈疑問符〉の組合せ
Comb. of "extent" and "?"
どれほど
How Much
～させる
—make a person do
～させない
—do not permit a person to do
～させられる
—is made to do
～させられない
—is not made to do
〈ひにち〉と〈疑問符〉の組合せ
Comb. of "date" and "?"
いつ
When
～せねばならない
—must
～しなくてもよい
—do not have to do
～であるにちがいない
—must be
～でないにちがいない
—is definitely not

Two dots on the upper corners mean plural numbers. The left side means past, and the right side, the future

The two symbols on the right, showing extent, are taken from the gestures in which hands are used to show small or big sizes

All nouns basically become verbs by being placed to the right of the bar. Dot on the left is past, on right, future

The equal sign is used to denote same meaning. Right is negation. Location on left is past, on right, future

editorial note:

A study of early writing systems shows that most modern scripts must have been developed from pictorial representational signs of some sort, rather than from invented abstract marks. Pressures in the development of spoken language gradually turned these scripts into phonetic, or partly phonetic systems.
Pictorial graphic sign systems did not disappear, however, and they have recently enjoyed a significant revival along major traffic routes and in international airports, for example.

One of the most interesting features of Yukio Ota's projected system is that it attempts to fuse together Eastern and Western modes of speech transcription. As he explains, he has modelled LoCoS on features of the Japanese hieroglyphs called Kanji. *(Kanji are the ideographic characters borrowed from Chinese, that together with Kana phonetic scripts make up the Japanese written language).*

Kanji characters represent morphemes—that is units of form and meaning—rather than units of sound, such as syllables or phonemes. Chinese characters hold few firm clues as to their pronunciation or, rather, one has to know how they sound already before such clues can be judged useful or not.

Ota's system, however, embodies rules governing the pronunciation of the various characters. It seems also to have a Western syntactical structure, unlike Chinese, which lacks tenses, declensions, formalized parts of speech, and so on.

Language is spoken sound, and as such it need have nothing to do with the ways used to transcribe sound. Nevertheless, a preoccupation with the development of newer forms of communication forms is understandable. We inhabit a planet that is changing at an increasing rate.
What we succeed in communicating is only determined by the means we use for communication, and Western sounds and forms are only one among many. It is only an historical accident that has led to the roman script being the major vehicle for present-day communication.
Increasingly, due to modern communication devices, we have been driven to the expedient of inventing new systems of recoding the existing alphabet.
Perhaps we will ultimately be forced to reorganize and elaborate entirely new ways of transcribing language.

One of the characteristics of LoCoS is that the part of speech (meaning) of a word can be changed by its position in the square. All words are placed in three rows of squares lined up in a row to form sentences. Since the main contents are placed in the centre row, the necessary major meanings can be speedily grasped. The top and bottom squares explain the main part as adverbs and adjectives, but those which are important can be placed in the centre row. Such a visual composition makes the relations between words much clearer. On the right, the word "eye" is used with the basic form for a verb to become "see". A dot on the left makes it "saw", a dot on the right makes it "will see "

*Here are the rules for pronunciation: the position which a word occupies in the square is divided into nine spaces as shown in figure 1. All words are formed through the combination of the 18 picture elements in figure 2. Forms are given consonants and the positions, vowels. The nine vowels are pronounced on the basis of where the dot is placed in the square. Of the picture elements, those with an * can be used by changing their direction. Direction is indicated by adding any of the eight vowels outside of "O".*

The picture element is placed at "O" in the centre. The following is the general principle for pronunciation of words: In the case of the word "house", the picture element "V" is "VAI" because it is at "A" position and is facing toward "I". Since "H" is at the centre and is facing upwards it becomes "HO" so that the whole becomes "VAIHO." Some supplementary rules and examples are shown below

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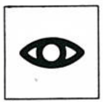
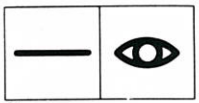
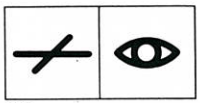
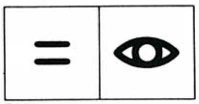
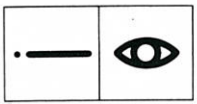
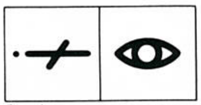

目
Eye

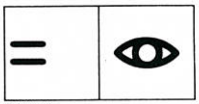

見る
See

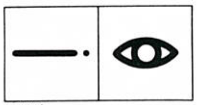

見ない
Won't see

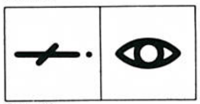

目である
Is an eye

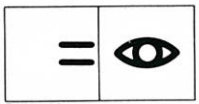

見た
Saw


見なかった
Didn't see


目でなかった
Was ~~not~~ an eye


見るだろう
Probably will see.


見ないだろう
Probably won't see.


目でないだろう
Probably is ~~not~~ an eye.

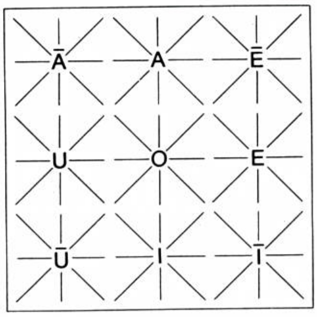


figure 1

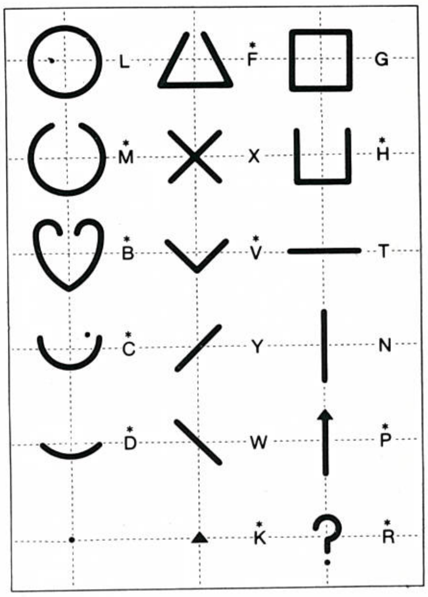
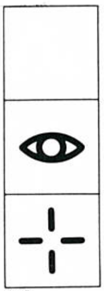
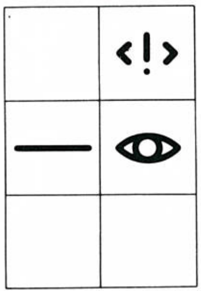
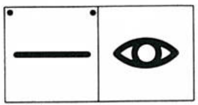


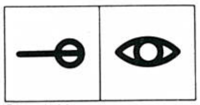
figure 2

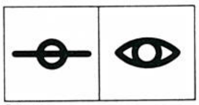
The example on the right shows an adverb and an adjective modifying a noun. When the word "light" is placed in the bottom row, it becomes the adjective "shining" and modifies the "eye" in the centre square. If the word "accurate" is placed in the top row and modifies the verb "see". it becomes "see accurately"

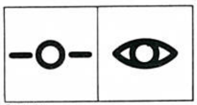

光る目
Shining eye.

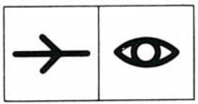

しっかりと見る
Look at steadily.

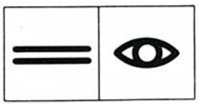

見ましょう
Let's look.

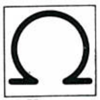

見ることができる
'Can see.

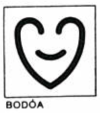

見てもよい
It is all right to look.

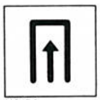

見た方がよい
It is better to look.

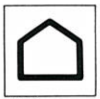

見させる
Permit to see.

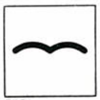

見なければならない
Must see.

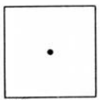

MOITTI

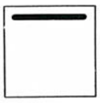

BODÓA

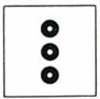

HOIPO


VAIHO

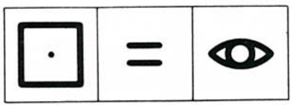

ZDOI

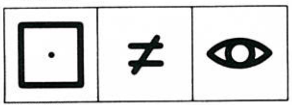

O TA

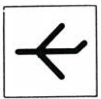


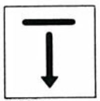

LAOI

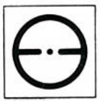
The example sentence below has the words lined up in the English order. The relations between the centre row and the top row have already been explained, but it can be seen that the general meaning can be understood from the centre row alone. Words can be placed in the centre row for emphasis

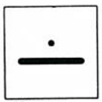

これは目である
This is an eye.

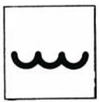

これは目ではない
This is not an eye.

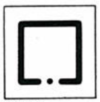

VOETOWE


TAPOA

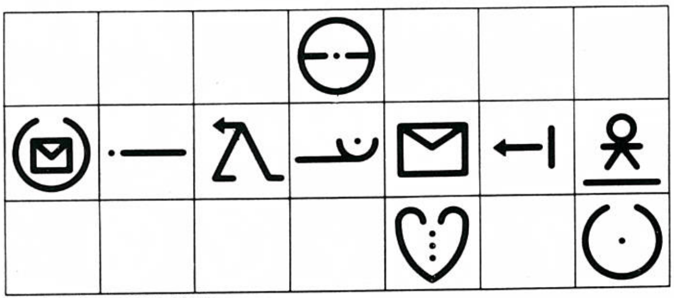

LOTTOO


ATO

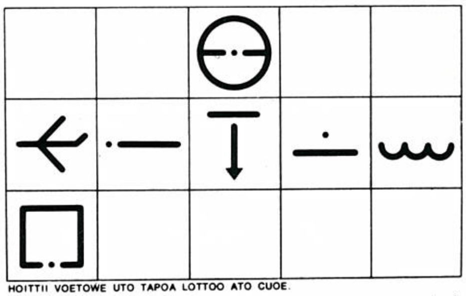

CUOE


HOITTII

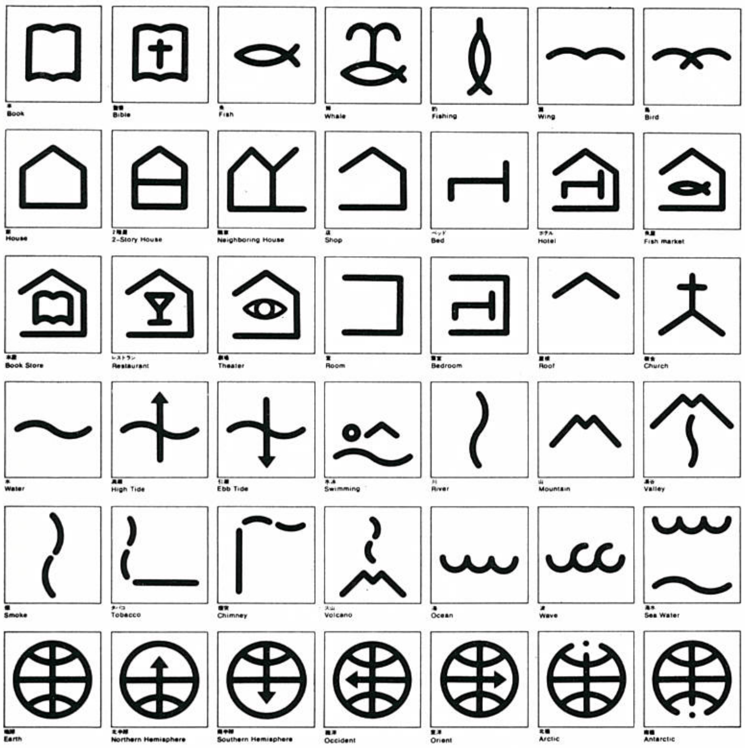
Example of sentence pronunciation using the above rules and system: Pronunciation order of each word (left) is in the order for English. Better pronunciation is possible by changing the combination of picture elements and consonants (figure 2) and position within the frame and relation with vowels (figure 1)

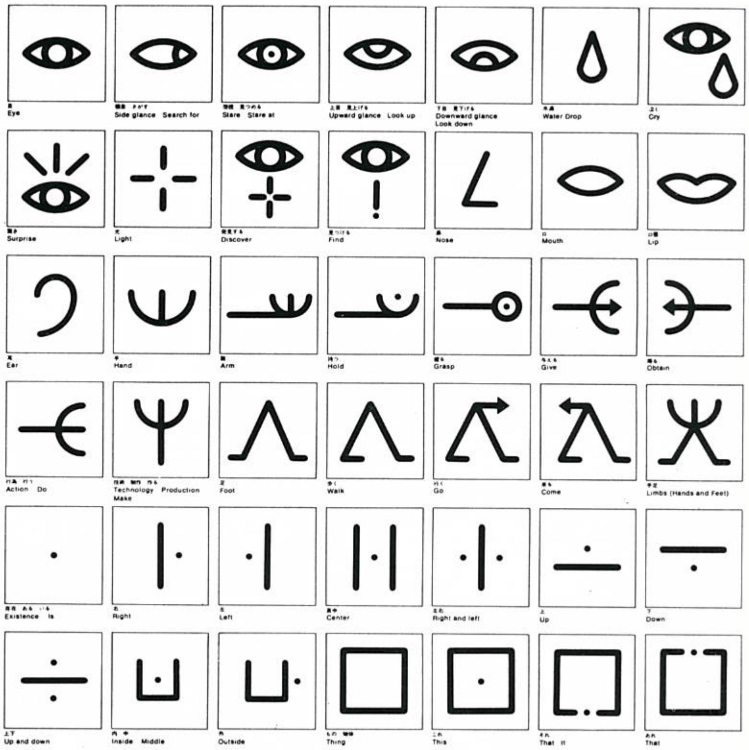


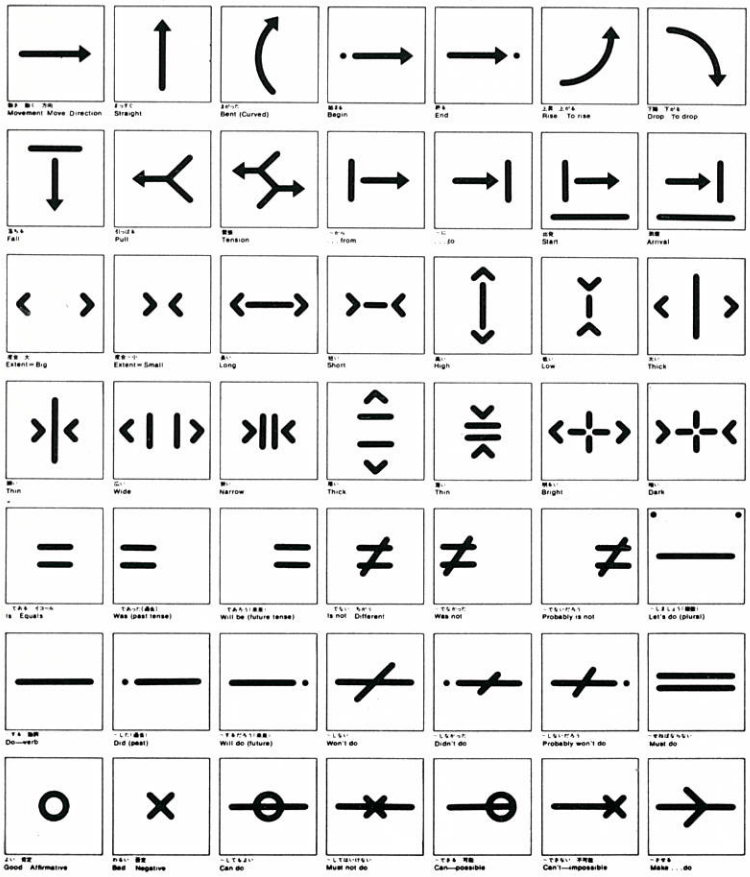
郵便夫は今朝私の郷里から悲しい手紙をもってきました
The postman brought me a sad letter from home this

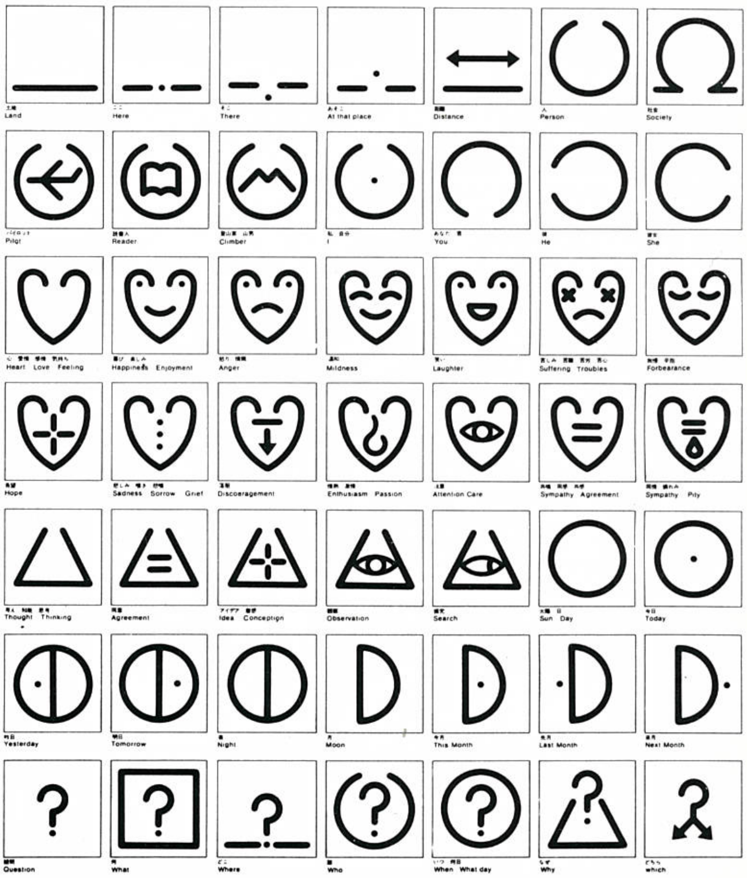

HOITTII VOETOWE UTO TAPOA LOTTOO ATO CUOE.

Part of the collection of LoCoS words is shown on this double spread. The principle is that the meaning of words can be understood just by looking at them, and care was taken to make meanings easily understandable through the combination of basic forms with common meanings. Only the representative meanings are given here. Read the preceding main article for explanations on how the meanings and part of speech of a word can change according to use. Yukio Ota contends that by means of his LoCoS system, the 30,000 words used daily can be cut by 10,000 words. 364 LoCoS words are shown here, but anyone can increase the number through combinations of the various words


Book
Bible
Fish
Whale
Fishing
Wing
Bird
House
2-Story House
Neighboring House
Shop
Bed
Hotel
Fish market
Book Store
Restaurant
Theater
Room
Bedroom
Roof
Church
Water
High Tide
Ebb Tide
Swimming
River
Mountain
Valley
Smoke
Tobacco
Chimney
Volcano
Ocean
Wave
Sea Water
Earth
Northern Hemisphere
Southern Hemisphere
Occident
Orient
Arctic
Antarctic


Eye
Side glance Search for
Stare Stare at
Upward glance Look up
Downward glance Look down
Water Drop
Cry
Surprise
Light
Discover
Find
Nose
Mouth
Lip
Ear
Hand
Arm
Hold
Grasp
Give
Obtain
Action Do
Technology Production Make
Foot
Walk
Go
Come
Limbs (Hands and Feet)
Existence Is
Right
Left
Center
Right and left
Up
Down
Up and down
Inside Middle
Outside
Thing
This
That It
That


Movement Move Direction
Straight
Bent (Curved)
Begin
End
Rise To rise
Drop To drop
Fall
Pull
Tension
. . . from
. . . to
Start
Arrival
Extent = Big
Extent = Small
Long
Short
High
Low
Thick
Thin
Wide
Narrow
Thick
Thin
Bright
Dark
Is Equals
Was (past tense)
Will be (future tense)
Is not Different
Was not
Probably is not
Let's do (plural)
Do—verb
Did (past)
Will do (future)
Won't do
Didn't do
Probably won't do
Must do
Good Affirmative
Bad Negative
Can do
Must not do
Can—possible
Can't—impossible
Make . . . do


Land
Here
There
At that place
Distance
Person
Society
Pilot
Reader
Climber
I
You
He
She
Heart Love Feeling
Happiness Enjoyment
Anger
Mildness
Laughter
Suffering Troubles
Forbearance
Hope
Sadness Sorrow Grief
Discoeragement
Enthusiasm Passion
Attention Care
Sympathy Agreement
Sympathy Pity
Thought Thinking
Agreement
Idea Conception
Observation
Search
Sun Day
Today
Yesterday
Tomorrow
Night
Moon
This Month
Last Month
Next Month
Question
What
Where
Who
When What day
Why
which

Yukio Ota's article was first published in the well-known Japanese graphic design journal, Graphic Design, *which is edited by Graphic Design Associates and published by Kodansha Limited. We are grateful to them for their permission to print this edited version*

icographic 6, 1973, pp 15-19
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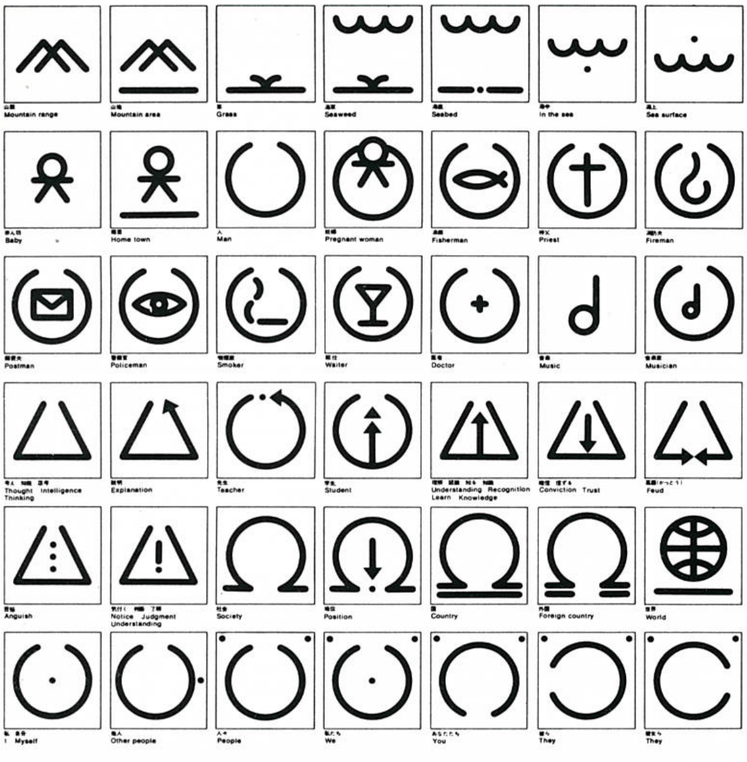
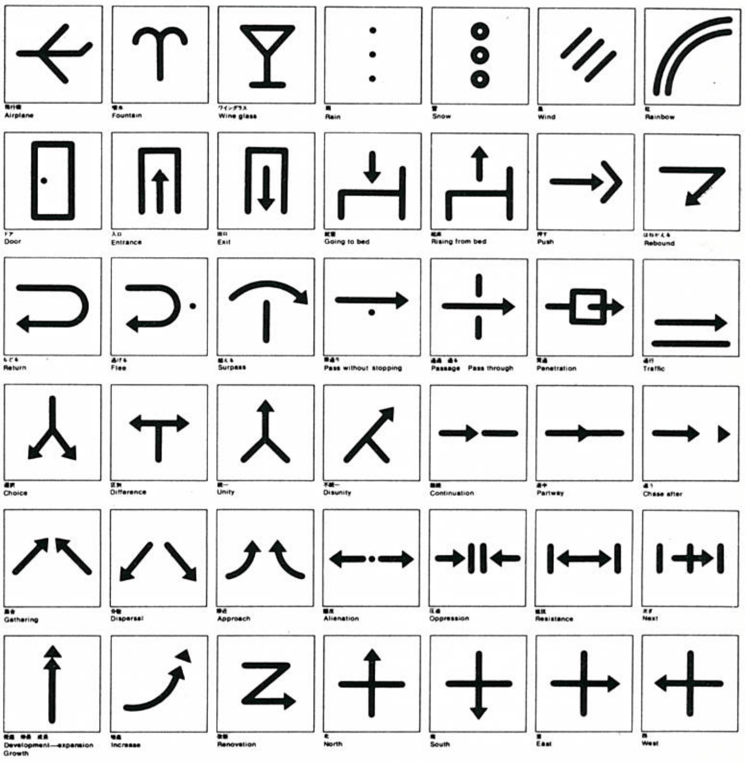
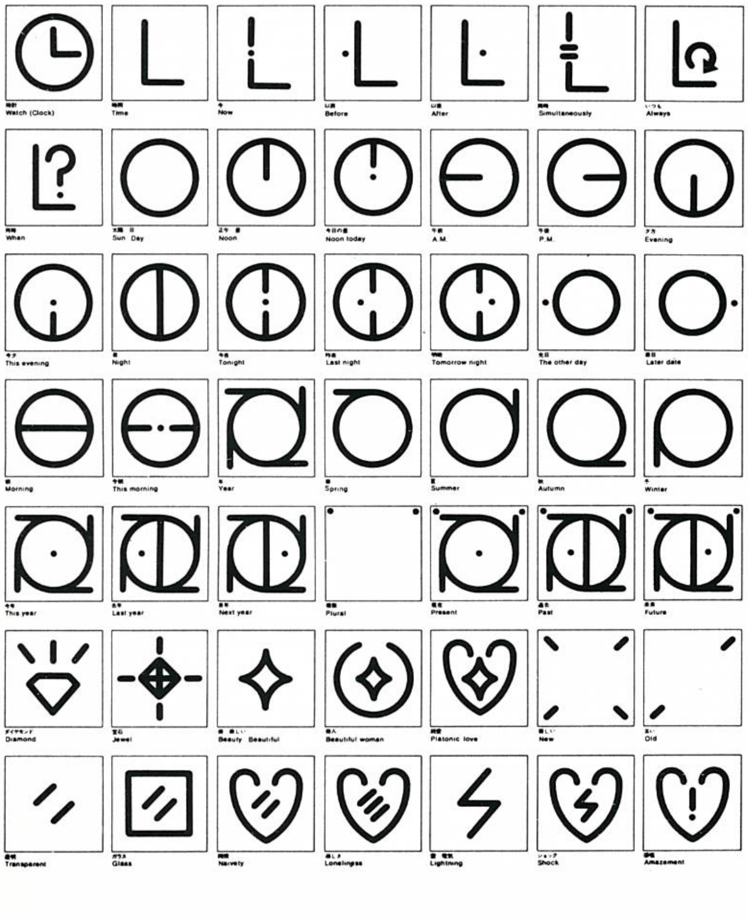
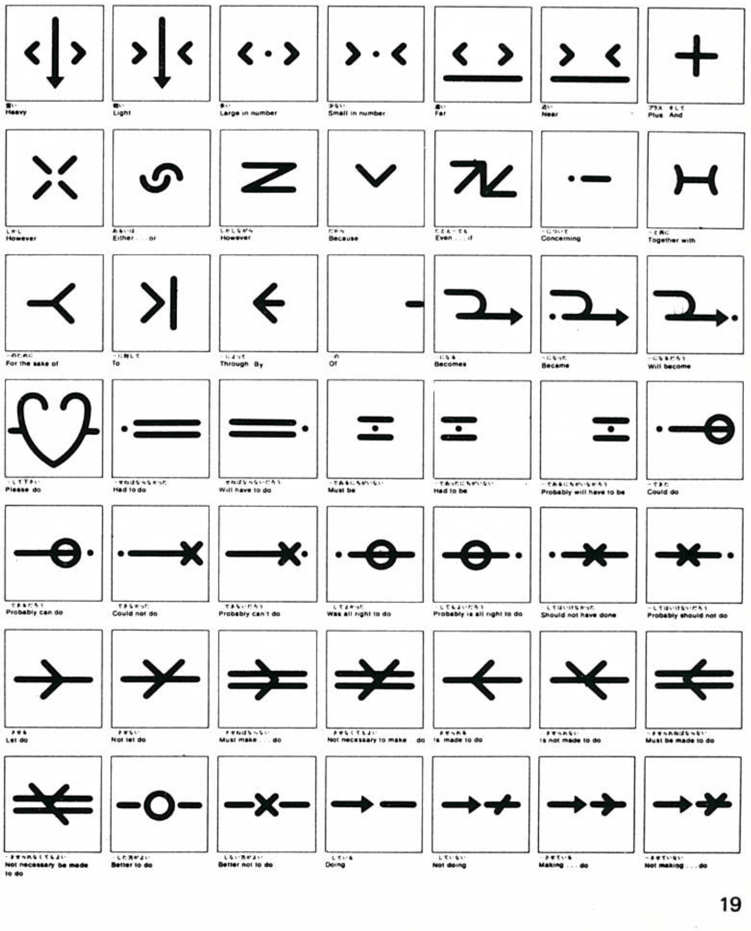

Mountain range
Mountain area
Grass
Seaweed
Seabed
In the sea
Sea surface
Baby
Home town
Man
Pregnant woman
Fisherman
Priest
Fireman
Postman
Policeman
Smoker
Waiter
Doctor
Music
Musician
Thought Intelligence Thinking
Explanation
Teacher
Student
Understanding Recognition Learn Knowledge
Conviction Trust
Feud
Anguish
Notice Judgment Understanding
Society
Position
Country
Foreign country
World
I Myself
Other people
People
We
You
They
They


Airplane
Fountain
Wine glass
Rain
Snow
Wind
Rainbow
Door
Entrance
Exit
Going to bed
Rising from bed
Push
Rebound
Return
Flee
Surpass
Pass without stopping
Passage Pass through
Penetration
Traffic
Choice
Difference
Unity
Disunity
Continuation
Partway
Chase after
Gathering
Dispersal
Approach
Alienation
Oppression
Resistance
Next
Development—expansion Growth
Increase
Renovation
North
South
East
West


Watch (Clock)
Time
Now
Before
After
Simultaneously
Always
When
Sun Day
Noon
Noon today
A.M.
P.M.
Evening
This evening
Night
Tonight
Last night
Tomorrow night
The other day
Later date
Morning
This morning
Year
Spring
Summer
Autumn
Winter
This year
Last year
Next year
Plural
Present
Past
Future
Diamond
Jewel
Beauty Beautiful
Beautiful woman
Platonic love
New
Old
Transparent
Glass
Naivety
Loneliness
Lightning
Shock
Amazement


Heavy
Light
Large in number
Small in number
Far
Near
Plus And
However
Either . . . or
However
Because
Even . . . if
Concerning
Together with
For the sake of
To
Through By
Of
Becomes
Became
Will become
Please do
Had to do
Will have to do
Must be
Had to be
Probably will have to be
Could do
Probably can do
Could not do
Probably can't do
Was all right to do
Probably is all right to do
Should not have done
Probably should not do
Let do
Not let do
Must make . . . do
Not necessary to make . . do
Is made to do
Is not made to do
Must be made to do
Not necessary be made to do
Better to do
Better not to do
Doing
Not doing
Making . . . do
Not making . . . do

Legibility research—the ergonomics of print

Jeremy J Foster

Jeremy J Foster is a lecturer in psychology and editor of Legibility Research Abstracts.
As a research fellow at the Manchester Polytechnic he conducted a programme of research into the legibility of print

Legibility research is concerned with studying the effects of visual information format on the responses made to it by the reader. A 2-way categorization scheme of legibility research is suggested, its aim being to show how the main areas within the subject are linked. Examples of these main areas of the subject are summarised.

For over half a century, psychologists have been investigating the impact of graphic design on the ability of the reader to deal with the information contained in the display before him. This research has had, until recently, relatively little impact, but there are signs of an increasing interest in its potential value. One of the problems has been that research, with a few notable exceptions, has been unco-ordinated and atheoretical, the occasional report appearing in isolation in a technical journal but not being followed up by subsequent studies. Legibility research, concerned with studying the effects of visual information format on the responses to it, may be seen as one branch of ergonomics, or human factors.
This discipline, which studies the interaction of man and his tools, has had a considerable growth in recent years, and perhaps the increased interest in legibility research reflects this. A practising designer might feel that the research-worker has little to offer since he (the designer) is continually making judgements concerning the success of different formats, based on his skill and experience. The research worker sets out to check these judgements, using the more objective procedures of scientific method and observation, and so may be seen as complementary to the designer.

There has been some confusion caused by the ambiguity of the word 'legibility,' and the tendency to use 'visibility' and 'readability' as synonymous with 'legibility.'
In order to avoid this, I find it helpful to think of legibility research as *the ergonomic study of visually-presented information displays.*
It therefore embraces not only typography, but also the use and design of signs, illustrations, maps, symbols, colour-coding systems—anything intended to help the reader see, recognize or understand a visually-presented message. ('Visibility' is used in a more restricted sense, to refer to the ease with which a form, or character can be identified, and 'readability' usually denotes stylistic complexity of text).
One difficulty that follows from the wide definition of 'legibility' is that it is *too* wide: we need, to make sense of the field, to divide the field up in some non-arbitrary system.

It is simpler to start by considering visual communication research in general. One can categorize it according to (a) the type of perceptual response required of the percipient, and (b) the kind of independent variable of most interest to the experimenter.

Response	**Independent variable**		
	Message	*Environment*	*Reader*
Detection			
Discrimination			
Identification			
Interpretation of meaning			

Table 1 Two-way classification of visual communication research

Response	**Independent variable**			
	Text	*Alphanumerics*	*Non-verbal*	*Environment*
Detection				
Discrimination				
Identification				
Interpretation of meaning				
Aesthetic interpretation				

Table 2 Classification of legibility research

The first method of categorization is based on the fact that visual communication is a multi-stage process, in which the percipient has first to *detect* the display ("there is something there"), then *discriminate* it ("it is different from other stimuli"), then *recognize or identify* it ("it is a halt sign," "it is a slogan") before proceeding to *interpret its meaning* ("it means that the brown wire is connected to the live terminal"), and then physically responding to it.

The ability of the person to accomplish each stage of the process will be determined by three types of factor, which allows a different categorization of research. The three kinds of factor are:—

1
the characteristics of the message—including such things as whether it is a picture or a word, whether it stands out from the background or merges with it, whether it is written in simple or complex language.
2
the characteristics of the environment—for example, whether it is well illuminated, moving or stationary, whether the display is solitary or one among a series.
3
the characteristics of the reader—his interest in and knowledge of the subject referred to in the message, his reading skill, his eye-sight, his level of attention.

(There are numerous factors under each heading, and the interrelationships of the factors is also obviously important; for example, a message's simplicity or complexity will be peculiar to each reader, depending on his linguistic skills, vocabulary, etc.)
If we bring together these two systems of classification we have *Table 1.*
In principle, one should be able to locate within one of the cells of *Table 1* any piece of research that investigates people's responses to visual displays.

Legibility research includes those studies which fall into the left-hand column, since in these experiments the effects of message-format on the percipient's responses is of most interest. The right-hand column contains those studies in which the characteristics of the reader are of most concern, and so many of them do not qualify as legibility research. The centre column includes studies which are often relevant to legibility, since the format of the message and the environment in which it appears interact to influence its detectability, discriminability, identifiability or interpretability.
For example, it may be that yellow print on a road sign is highly visible in daylight but much less so under orange-tinted street lighting.
In the hope of obtaining a more adequate system for classifying *legibility research, Table 1* has been modified to make *Table 2,* in which the final column of *Table 1* has been omitted and certain additions made.

Research workers have tended to concentrate on assessing the success of a display format by investigating the facility with which percipients respond to it—what is the maximum distance at which the sign can be seen? How many errors are made in interpreting this graph? How quickly can this text be read?
But the aesthetic aspect of good design, and the suitability of the format to the message have not been completely ignored: data on reader's preferences for different formats is sometimes reported.
The final row of *Table 1* has been added to include this type of response.

When one considers the nature of the display, it seems reasonable to distinguish verbal from non-verbal messages, since the former demands that the percipient possess certain linguistic skills not necessarily required by the latter.
The distinction is not rigid, since a word can become a sign, in that it does not have to be read but is identified and understood directly, merely from its form.
(This is seen most clearly with some trademarks, such as that for *Coca-Cola).* It is being increasingly recognized that the process of understanding letters, words and text are very different (see Smith 1971), and so in *Table 2* we separate textual messages from ones which employ alpha-numeric characters but not in text. This gives us the 20 cells of *Table 2.* The main strands of legibility research can be identified with cells of the table. In the remainder of this article, I shall survey some recent typical studies of the various categories.

icographic 6, 1973, pp 20-24

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Research with textual messages

Traditionally, most legibility research has compared typographic designs in terms of their effects on recognition of characters or reading of texts. This tradition maintains its strength. For example, Hartley and Burnhill (1971) report an investigation on the effects of justification on reading performance, in which they failed to obtain any measurable effect on reading performance when the line-endings of unjustified text were determined by syntactic considerations as opposed to a standard unjustified format, or when 33% of lines ended in hyphenated words compared with 0%.

Gregory and Poulton (1970) found that poor readers could read texts of short (seven-word) lines more rapidly if it was unjustified; with longer lines (averaging twelve words), justified and unjustified settings were read equally rapidly.

Carver (1970) investigated a more extreme alteration in the text's format. The four layouts shown in *figure 1* were tested for their effect on reading performance, it having been suggested that 'chunking' the information as in *Format B* (using space to divide it into meaningful units) may facilitate reading although the *No Capitalization format* slowed reading (as one would expect), the reader's performance on *Chunked* and *Newspaper formats* did not differ. (It might seem rather unnecessary to investigate the *No Capitalization format,* since it can surely be assumed that reading will be slowed down by this layout. The purpose of including it was to establish the precision of the experimental procedures. Carver argues that as this format reduced reading speed by 14%, the finding of no difference between the *Chunked format* and *newspaper-type format* cannot be attributed to imprecise experimental procedures). *see figure 1*.

Conventional (Nelson-Denny, Form A)

About three centuries after Homer's time, Greek poets began
to discover new kinds of verse, and the way in which poems were made.
No one has ever done so much for the poetry we write and read today
as the singers who sang in the islands of the Aegean Sea and in cities
on the mainland of Greece, like Thebes and Athens,

Chunked (Nelson-Denny, Form B)

The night was cloudy,
and a drizzling rain,
which fell without intermission,
added to the obscurity.
Steadily, and as noiselessly
as possible,
the Spaniards held their way
along the main street

Newspaper (Nelson-Denny, Form B)

The night was cloudy,
and a drizzling rain,
which fell without inter-
mission, added to the ob-
scurity. Steadily, and as
noiselessly as possible,
the Spaniards held their
way along the main street,

No Capitalization (Nelson-Denny, Form B)

the night was cloudy
and a drizzling rain
which fell without inter-
mission added to the ob-
scurity steadily and as
noiselessly as possible
the spaniards held their
way along the main street

figure 1 Four typographical formats studied by Carver

Attempts to improve the effectiveness of print as a teaching medium have also involved the use of additional aids beyond the organization of the material on the page. A number of investigators have looked at the effects of asking reader's questions on a text before or during reading. For example, Peeck (1971) compared the amount of a passage remembered after 7 days by readers who had examined questions on the passage before seeing it and by readers who had not seen the pre-questions. Those who had had the pre-questions remembered more about those parts of the text which had been referred to in them.

In a similar vein, Anderson, Goldberg and Hidde (1971) demonstrated that if readers had to fill in blanks in sentences, they remembered more than readers who did not have to fill in blanks. Such a finding would appear to have potential relevance to the design of much educational material.

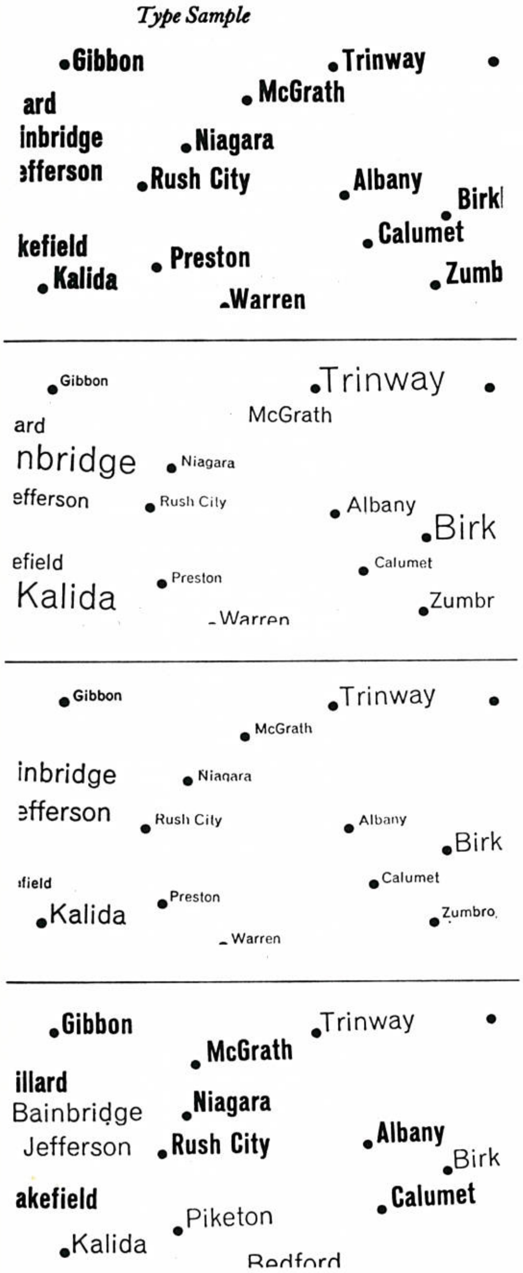
One example of a study of the aesthetic-emotional interpretation of a textual layout is that of Becker et al (1970), who showed that different typefaces needed different amounts of leading to look most appealing. Huck and Bounds (1972) showed that examiners with neat handwriting tend to give lower marks to messily-written essays; one might expect typographic layout to have comparable influence on the viewer's assessment of what he is reading.

Research with Alpha-numerics

When we consider the research performed using alphanumerics which do not form text, we find a wide range of response measures has been used. The discrimination of letters was studied, for instance, by Clement and Carpenter (1970) who presented pairs of letters and simply asked the viewers to say whether the letters were the same or different. They concluded that visual similarity of the letters, rather than similarity in the sound of the letter-names, determined the length of time it took for the subject to respond. A similar technique could be used to investigate character design or compare the designs of letters from different alphabets, but there do not yet seem to have been any experiments on these problems which have, in fact, used the same-different reaction time task.

The large majority of investigations of alphanumeric characters have used identification tasks, in which the viewer has to state the letter shown, or find a letter from an array of other letters. This procedure is applicable to many situations. Bartz (1970), for example, had people searching maps for target names, and showed that when maps contain mixed types, the targets are found more rapidly if the searcher knows the type in which the target name is printed; on the other hand, search is slower if the searcher does not know the appearance of the target name. *see figure 2.* Similarly, Wendt and Weckerle (1972) had children searching through lists of words, and found that indenting alternate words speeded search.

Although there is no reason why one should not study the detectability of alphanumeric characters, this technique does not seem to have been used. One could compare, say, the ability of viewers to detect letters from different alphabets when


Type Sample
Gibbon
Trinway
McGrath
ard
inbridge
Niagara
efferson
Rush City
Albany
Birk
kefield
Calumet
Preston
Kalida
Zumb
Warren
Gibbon
Trinway
McGrath
ard
nbridge
Niagara
efferson
Rush City
Albany
Birk
efield
Calumet
Preston
Kalida
Zumbr
Warren
Gibbon
Trinway
McGrath
inbridge
Niagara
efferson
Rush City
Albany
Birk
field
Calumet
Preston
Kalida
Zumbro
Warren
Gibbon
Trinway
McGrath
illard
Niagara
Bainbridge
Jefferson
Rush City
Albany
Birk
akefield
Calumet
Piketon
Kalida
Redford

Map Description	*List Description*
Map Five. All names set in 12-point bold sans-serif face (Venus Bold Condensed), capitals and lower-case.	Typewritten
Map Six. Contains 85 names set in 5-point Monsen Light, capitals and lower-case, and 58 names set in 10-point Monsen Light, capitals and lower-case.	*Test 6a*: Typewritten *Test 6b*: List set to match type in which name appears on map. *Test 6c*: List set to match type in which name appears on map.
Map Seven. Contains 47 names set in 5-point Monsen Light, 57 names in same face 8-point, and 36 names in same face 13-point, all capitals and lower-case.	*Test 7a*: Typewritten *Test 7b*: List set to match type in which name appears on map. *Test 7c*: List set to match type in which name appears on map.
Map Eight. Contains 81 names set in 10-point Monsen Light and 58 names in 12-point Venus Bold Condensed, capitals and lower-case.	*Test 8a*: List set to match type in which name appears on map. *Test 8b*: Typewritten *Test 8c*: List set to match type in which name appears on map.

figure 2 Some of the map typographies studied by Bartz

they were being shown slides, some of which were blank, some bearing a letter.
Whether the detectability of a typeface is related to its identifiability or discriminability would need to be established.

The effects of the format on the comprehensibility of numerical messages has been studied by Wright and Fox (1970), who have found that many types of tabular presentation are incomprehensible to large numbers of the population. They summarize the characteristics of a good table in asserting that there needs to be full and direct presentation of all the information the user will need. *see figure 3.* They recommend 8 to 12 point type, a vertical arrangement of grouped items, an absence of 'landmarks' in the table, and the use of typographic cues to differentiate different kinds of item.

Okada and Takeuchi (1971) looked at the aesthetic-emotional interpretation of alphanumerics by having sixteen judges assess the amount of difference between the appearance of different typefaces. Some judges based their assessments on the blackishness of types, others on differences in style. Other features of the typefaces, such as the presence of serifs, italics or non-italic form, condensed or expanded style, did not influence the judgements.
However, the significance of this finding is unclear; more research is needed to establish whether, for example, most untrained people do not appreciate these differences between typefaces.

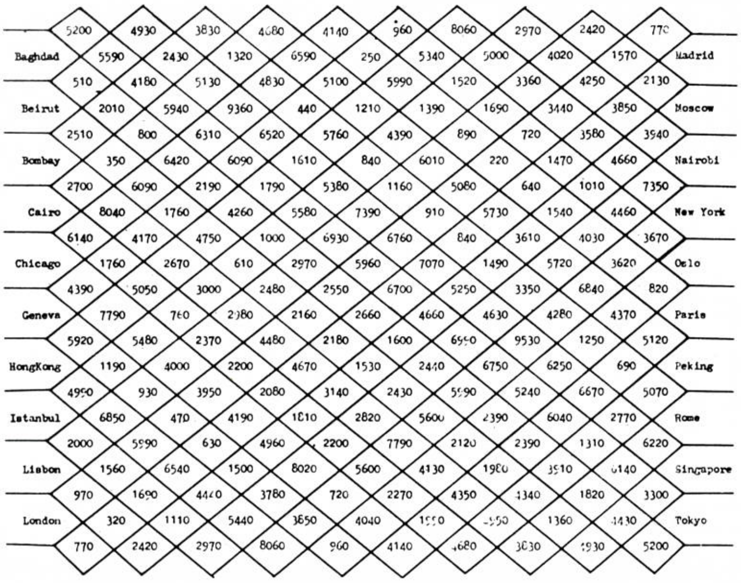
Research with non-verbal messages

Non-verbal visual communication embraces a wide range of presentation forms, which have been investigated in many ways. Johansson and Backlund (1970), put up a road sign just before a bend in the road. Drivers coming round the bend found themselves in a police-trap. One can imagine them being quite thankful when they discovered they were merely asked questions about which was the last road sign they had seen!
There is, perhaps, a lesson to be drawn from the fact that while there was a 66% chance that drivers would see a warning of a police control, there was only a 26% chance they would see a warning of a pedestrian crossing. The overall probability of a sign being reported was only about 50%.

Dooley and Harkins' (1970) looked at the discrimination of stimuli, and found that when waiting, people spent more time looking at a coloured than a black-and-white chart. (But this did not increase the amount of information from the chart that they remembered afterwards).

Brown and Hull (1971) tried to clarify some of the problems associated with the colour-coding of stamps, by presenting housewives with stamps of different colours and asking them to judge whether the colours were the same or different.
The colour of the decimal stamps was, in part, determined by their research, although they had to make some modifications to their original conclusions due to aesthetic considerations.

Turning to comprehension, we find that a number of researchers have considered the ease with which various non-verbal messages can be understood. Frances Dwyer of Pennsylvania State University has performed a lengthy series of experiments on the influence of illustrations on the amount that readers learn from a lesson.
In one typical experiment (Dwyer 1968) the effectiveness of types of illustration was compared. School-children were given a talk on the human



	5200	4930	3830	4680	4140	960	8060	2970	2420	770	
Baghdad	5590	2430	1320	6590	250	5340	5000	4020	1570		Madrid
	510	4180	5130	4830	5100	5990	1520	3360	4250	2130	
Beirut	2010	5940	9360	440	1210	1390	1690	3440	3850		Moscow
	2510	800	6310	6520	5760	4390	890	720	3580	3940	
Bombay	350	6420	6090	1610	840	6010	220	1470	4660		Nairobi
	2700	6090	2190	1790	5380	1160	5080	640	1010	7350	
Cairo	8040	1760	4260	5580	7390	910	5730	1540	4460		New York
	6140	4170	4750	1000	6930	6760	840	3610	4030	3670	
Chicago	1760	2670	610	2970	5960	7070	1490	5720	3620		Oslo
	4390	5050	3000	2480	2550	6700	5250	3350	6840	820	
Geneva	7790	760	2980	2160	2660	4660	4630	4280	4370		Paris
	5920	5480	2370	4480	2180	1600	6990	9530	1250	5120	
HongKong	1190	4000	2200	4670	1530	2440	6750	6250	690		Peking
	4990	930	3950	2080	3140	2430	5990	5240	6670	5070	
Istanbul	6850	470	4190	1810	2820	5600	2390	6040	2770		Rome
	2000	5990	630	4960	2200	7790	2120	2390	1310	6220	
Lisbon	1560	6540	1500	8020	5600	4130	1980	3510	6140		Singapore
	970	1690	4440	3780	720	2270	4350	4340	1820	3300	
London	320	1110	5440	3850	4040	1550	4550	1360	4430		Tokyo
	770	2420	2970	8060	960	4140	4680	3830	4930	5200	

A table which saves space, but perhaps not time

New	Old	New	Old	New	Old	New	Old
0	—	25	5/–	50	10/–	75	15/–
1	2d	26	5/2d	51	10/2d	76	15/2d
2	5d	27	5/5d	52	10/5d	77	15/5d
3	7d	28	5/7d	53	10/7d	78	15/7d
4	10d	29	5/10d	54	10/10d	79	15/10d
5	1/–	30	6/–	55	11/–	80	16/–
6	1/2d	31	6/2d	56	11/2d	81	16/2d
7	1/5d	32	6/5d	57	11/5d	82	16/5d
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
18	3/7d	43	8/7d	68	13/7d	93	18/7d
19	3/10d	44	8/10d	69	13/10d	94	18/10d
20	4/–	45	9/–	70	14/–	95	19/–
21	4/2d	46	9/2d	71	14/2d	96	19/2d
22	4/5d	47	9/5d	72	14/5d	97	19/5d
23	4/7d	48	9/7d	73	14/7d	98	19/7d
24	4/10d	49	9/10d	74	14/10d	99	19/10d
						100	£1

A linear explicit table

figure 3 Two tabular formats studied by Wright and Fox

heart, but the illustrations (slides) varied according to the group they were in.
One group saw just printed words naming the concepts under discussion. Other groups saw uncoloured or coloured line drawings, photographs of a model heart, coloured or uncoloured photographs of a real heart.
Dwyer reports that, taking economy into account, the black and white line drawings were the most effective educational aid.

A very practical method of testing comprehensibility was used by Spencer and Miles-Walker (1971) who requested subjects to assemble shapes specified in engineering drawings from components.
They concluded that the drawing should convey the principle underlying the layout. Views which maximized the representational appearance of the drawn object were preferred by the reader.

Research into environmental effects

The environmental context within which visual communication takes place has not been investigated so frequently as the format of the message itself.
Cavonius and Hilz (1970) provide an example of research which has probed the effect of environment on detection and discrimination. Detection of dim lights is easiest after the viewer has adapted to red illumination but discrimination of detail is better after exposure to orange illumination.

Snowberg (1971) showed that compared with a white one, a coloured background diminished subjects' ability to identify letters.

There has been a lot of research into the influence of environmental characteristics on the ability to interpret the meaning of visual messages.
Illumination has been the most investigated topic, but factors such as noise-distraction and vibration have also been considered.
Tinker (1965), who has spent a life= time on legibility research, compared reading performance at various illumination levels, and recommends 15-25 foot candles illumination for sustained reading of 10 point type, 25-35 foot candles for 7 point type or smaller.

Hopson, Cogan and Batson (1971), incorporated into their work a study of the influence of an environmental variable (illumination intensity) on aesthetic judgement (colour preferences), but failed to discover any reliable effect of the one on the other.

This brief survey of a small sample of, mainly recent, legibility research gives some indication of the range of display factors studied and responses measured. The scheme shown in *Table 2* helps one, I hope, to see some structure in this very wide area, but it must be admitted that it is difficult to summarize the achievements of legibility research.
Probably this arises from the fact that one of the most prominent gaps in the area of legibility research occurs where the *theory* should be. Most legibility work is atheoretical, and it is this which produces the appearance of a rough collection of disparate traditions and interests.
Donald Broadbent, one of Britain's most prestigious psychologists, has observed that "the best contribution to practical problems is to produce a general theory;" there is as yet no general theory, either of communications generally, or of visual communications in particular, which can usefully be applied to the problems of legibility work.
When such a theory is developed, it may be that the structure of legibility research will alter; however, one suspects and hopes that research will be very closely linked to practical problems and their solution.

The central problem must be; where do we go from here?
For the 50 years or so of legibility research, there was a tendency to examine single features of the display in isolation, to look—for example—at the influence of type size alone on identifiability or reading.
As experience was gained, more complex work was done, in which it was appreciated that the various features of the display interact, optimal size being related to leading and line-length for instance.

At present there is a tendency to move away from studies of individual details, and to concentrate on the study of larger-scale display features, to compare actual graphic layouts as a whole and not their components individually.

We can, perhaps, expect to see in the future an expansion of this tendency, with researchers applying their skills to a wider range of visual communications situations.

As a theoretical basis for legibility arises and further information is acquired, we can look forward to a closer co-operation between the practitioner and the researcher; we may hope this will be to the benefit of both.

Reading

The main survey of legibility is Herbert Spencer's *The Visible Word* (Lund Humphries), although this takes a more limited sense of legibility than used here.
Somewhat out-of-date is Miles Tinker's *Legibility of Print* (Iowa

State University Press 1963) and *Bases of Effective Reading* (University of Minnesota Press 1965).
Bror Zachrisson describes his own research in *Studies in the Legibility of Printed Text* (Almqvist and Wiksell, Stockholm 1965).
Sir Cyril Burt's *Psychological Study of Typography* (Cambridge 1959) is very limited in scope.
Recent work is abstracted in *Legibility Research Abstracts 1970* and *1971* (both published by Lund Humphries).

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New type face for Eye

Today's issue of *Private Eye* is set in the new type-face GNOME 69, specially designed for *Private Eye* by a firm of South London layabouts.

The type face gives *Private Eye* an entirely new up-to-the-minute look as well as providing a spectacular increase in legibility, clarity and resistance to dry rot and woodworm.

The final paragraph of this announcement is set in the old type so that it can be contrasted with the improved legibility of GNOME 69.

A final word on legibility research is provided by this cutting from the British satirical magazine Private Eye.

Note to contributors

icographic would like to include a considerably larger selection of material from our Member Associations in future issues of the magazine.
Accordingly the Executive Editor would like to receive articles from members, or suggested experts in member countries.
Wherever possible, we would like to group submitted articles into an issue that bears upon a particular theme.
It would be helpful if such contributions were thought of as attempts to add to the collective knowledge of our organization and to the raising of design standards via cognitive, rather than intuitive judgements.
Graphic design has been slower to accumulate 'ergonomic' data than some of the other design professions, so that we would welcome reports of any investigations that could add to an understanding of the processes of visual communication.

Articles can be from 2000 to 6000 words (depending upon the extent of illustrative material).
They may be submitted in either French, German or English.
It would be particularly helpful if summaries in the remaining two languages could be submitted with the main text.

Listed below is a selection of suggested headings. The list is in no way definitive, it is intended merely to trigger off responses from possible contributors.

Advertising (persuasive or informative), Aesthetics (ethical or descriptive), Art movements in relation to visual communication, Animation, Book Design, Creativity, Cartography, Cartoons, Computer typesetting, Computer graphics, Corporate image, Children's books, Concrete poetry, Colour theory, Colour printing, Design philosophy, Design practise, Education, Education of graphic designers, Educational use of visual communication, Ergonomics of visual communication, Film, Film=setting, Graphic design schools, Graphics in architecture, coinage, entertainment, heraldry, music, magic or the occult, popular culture, religions, sport, science, space-travel, stamps, seals, transport, etc.
Human communication, Information theory, International languages, Legibility research, Methodology, Magazine and newspaper design, Psychology of perception, Printing processes, Photography, Semiotics, Traffic signs, Television and video-tape as media for visual communication, 'Underground' publishing.

Please address all contributions or enquiries to the Executive Editor,
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Radnor Walk, Shirley, Croydon
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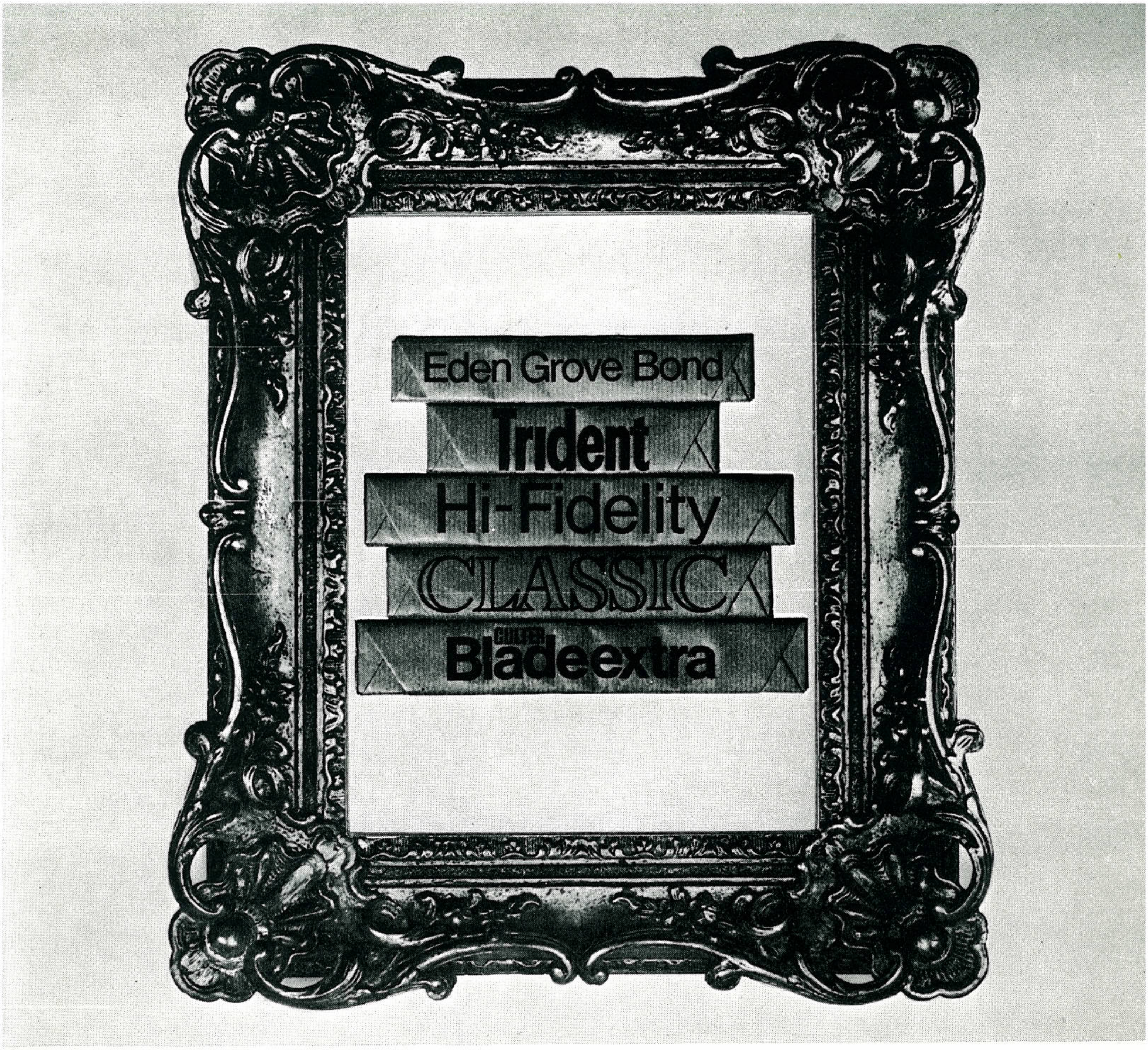

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ICOGRADA

The International Council of Graphic Design Associations was founded in London in April 1963.

ICOGRADA is an association of independent Member Associations. Membership is open to societies of professional graphic designers and organisations concerned with the training of designers and/or the raising of graphic design standards. Member associations are elected at the biennial General Assembly, which elects also the Executive Board, determines policy and overall activities and agrees financial arrangements.

The aims of ICOGRADA are:

1
to raise internationally the standards of graphic design and professional practice by all practicable means.
2
to collect and exchange information on professional, educational and technical matters.
3
to improve graphic design training and to assist the interchange between countries of graphic designers, teachers and students.
4
to organise exhibitions, international assemblies, congresses and symposia and publish documentation on graphic design and visual communications technology, including a News Bulletin.
5
to act as an international forum for co-operation and exchange of views between designers, organisations representing professionals from allied and other fields and those of commerce and industry.
6
to encourage the better use of graphic design and visual communication as a means to improve understanding between people everywhere.

Printed in England