

A HISTORY OF OFFICE EQUIPMENT
AND ITS FUTURE

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'File Under Future'

- A HISTORY OF OFFICE EQUIPMENT
AND ITS FUTURE

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INTRODUCTION

"I begin to suspect that a long period of purgatory has got to be gone through before we reach the computerized kingdom of Heaven, we are presently stuck well into it"

- Bernard Levin, Daily Mail.

Every New Year they are at it - experts of one kind or another gazing earnestly into their crystal balls, after everyone has picked over the dead year, analysed every minute of it and projected all sorts of new trends into the next twelve months, the fortune teller steps in. As the year to come seems full of mystery and promise, the temptation to look ahead even further - ten years, twenty-five years, a century is irresistible. Dream cars, cities, offices and homes of the future all take shape in our minds once again.

But where do we find our visions of tomorrow? Why do we automatically see all glass paperless, humanless offices full of computers and robots? The funny thing is, no matter how much the world doesn't change and predictions fail to come true, the picture of the future we carry about in our heads stays almost the same. If past experts have predicted things that amuse us today, perhaps we should, laugh at ourselves as well.

The trouble with trying to predict the future, is that one can never be sure of the outcome. Nevertheless, the best indication of future events is generally achieved by a close observation of whats' going on in the present.

I've been taking a close look at the current state of the art in office equipment; concentrating on typewriters and computers in particular those designed by Ettore Sottsass, in order to see

what is in store for us. What can people expect offices to look like in five years time? And how it will change the way in which managers and employees go about their work. Will we create a society in which work is not seen as an essential part of life, essential to one's self respect? We really cannot know everything the future will bring - although one thing is certain; there will be a change and there will be a challenge. Choices will have to be made and decisions are best made against a background of knowledge. If this technology is capable of changing our lives then it is best that we understand it so that we can help it along or challenge it. This thesis should help to provide a little of that understanding.

CHAPTER ONE :

WHAT PEOPLE DO AT WORK

"The extension of man's intellect by machine and the partnership of man and machine in handling information may well be the technological advance dominating this century"

- Simon Ramo of Thompson Ramo
Wooldridge.

Improving office productivity entails better use of human technical and spatial resources. This is no easy task. A starting point is to find out what actually happens in offices today - not what people say or think goes on. Much of what is said about what goes on in the office is myth. The way to determine what people actually do, rather than what they are supposed to do (or, for that matter, what they think they do), is to watch them. Research of this kind has exposed several office myths for what they are - as the following pages show. This survey was carried out on a number of office systems in both Ireland and England.¹

Compared with companies of a century ago today's firms have proportionally more people in the middle levels - but many so-called middle managers do not have clearly defined activity patterns. Typically they are professionals with no subordinates and little supervision. They are often the "knowledge workers" for whom new technology is said to hold the greatest promise.

A person observing office work today would see many of the same tasks that occurred twenty years ago: People are reading, writing, talking, typing, operating calculators, dictating and filing. But, there is one major difference: many tasks are now being performed with Visual Display Terminals (VDTs). The emergence of VDTs makes it

¹Survey was carried out over 3 days for 10 hrs.

possible to shift from the traditional way of doing office work based mainly on paper handling, to perhaps a paperless office in which information is stored in computers and transmitted through networks. Today there are about 15 million VDTs' in the United States and the number is increasing rapidly. By 1990, between 40% and 50% of all American workers will be using electronic terminal equipment on a daily bases. Some thirty-eight million terminal workstations will then be installed in offices, factories, and schools. There may also be thirty four million portables.²

During the 1960's and early 1970's, most computers were mainframe machines operated by specialists and used primarily for accounting functions such as billing, inventory and payroll. Today the mainframe may be replaced or complemented by several compact personal computers interconnected to form an information network. This network will play a major role in the future office.

Research undertaken to establish the nature of activity within the office, comprised of observation and analysis of questionnaires. Seven basic task categories were used to describe office work :

1. talking face to face
2. telephone use
3. reading
4. writing
5. use of office machines
6. use of laboratory equipment
7. miscellaneus

In some tasks there were interesting differences between

²Survey carried out in 1970 by Human Factors Association.


the results from the questionnaires, people underestimated the amount of time they spent talking face-to-face (20% versus 35%) and overestimated the amount of time writing (20% versus 14%) and reading (20% versus 12%). Both methods produced similar results in estimating the use of telephones (8% versus 7%), laboratory equipment (13% versus 13%) and office machines (5% versus 3%)³.

This seems to reflect a tendency to overestimate the time for activities people think of as intellectual or productive and underestimate the amount of "non-productive" work. It emerges that communication with people, not equipment, is the main activity in the office. (This is not only related to time, but also to response). The introduction of microcomputers did not change this focus. Another lesson to be learnt from watching people is that loosely structured systems (hardware) are often better than strict ones: so that technology must be flexible. And this means making it available to the greatest possible number of people. The most important message of all is that organizations can be designed - spatially and technologically. The design issues that office automation raises, therefore are not just physical ones such as ergonomics or form - although they are important. There are more fundamental issues that need to be addressed, such as the effect technology has on office workers.

Having established what people actually do at work, the next step is to see what equipment they have used in the past, what technology is currently available, and what people can expect to be using in their offices and homes in the next five years.

This dissertation looks into two pieces of office equipment namely the typewriter and the computer and follows their development from the early sixties to the present day. The state of the art can

³Survey carried out in 1970 by Human Factors Association.



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often tell us what we can expect to see in our offices in the next few years and with this knowledge certain men of vision have foretold what equipment will suit the environment of the next decade.

CHAPTER TWO :

THE SIXTIES

"Sottsass put an important emphasis on the search for form, not for the isolated object, but for objects that interact with each other in the environment"

- Penny Sparke

Sottsass collaboration with the firm of Olivetti began in 1958 and represented yet another facet of his varied interpretation of the term "designer". His involvement with industry in general had developed in the 1950's with his work for several furniture firms, and consequently he jumped at the opportunity of working with a firm that was beginning to produce objects that belonged very much to the second half of the twentieth century.

Sottsass undertook several designs of typewriters for Olivetti during this decade. The Tekne 3 of 1960, (FIG. 1), the Praxis 48 of 1962-3 (FIG. 2) and the Deluxe and Dora portables of 1965.

These were all inventive, innovatory designs that took electronic and office machinery outside the normal bounds of efficiency for efficiency's sake and included considerations about its symbolic and psychological functions. The Praxis 48 (FIG. 2) for example, gave a new identity to the typewriter; with the carriage at the same level as the machine body, it was a small, light, compact electric machine. Domus described it as "almost a toy, a decorative object which can be left on the table". The precision and regularity in the styling of this and other objects combined with the awareness of the human relationship with the machine puts Olivetti products in



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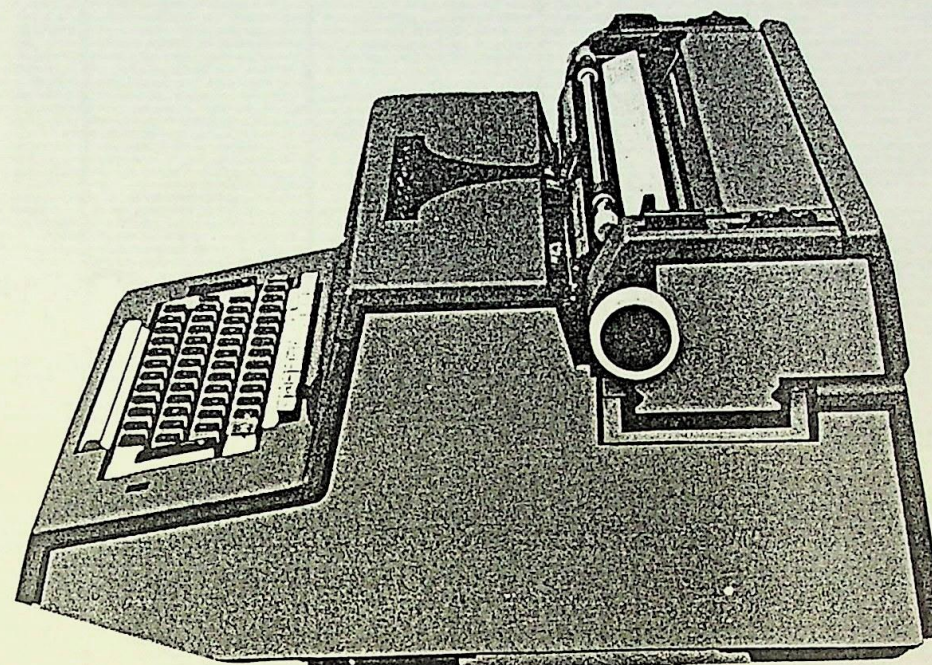


FIG. 1. THE TEKNE 3



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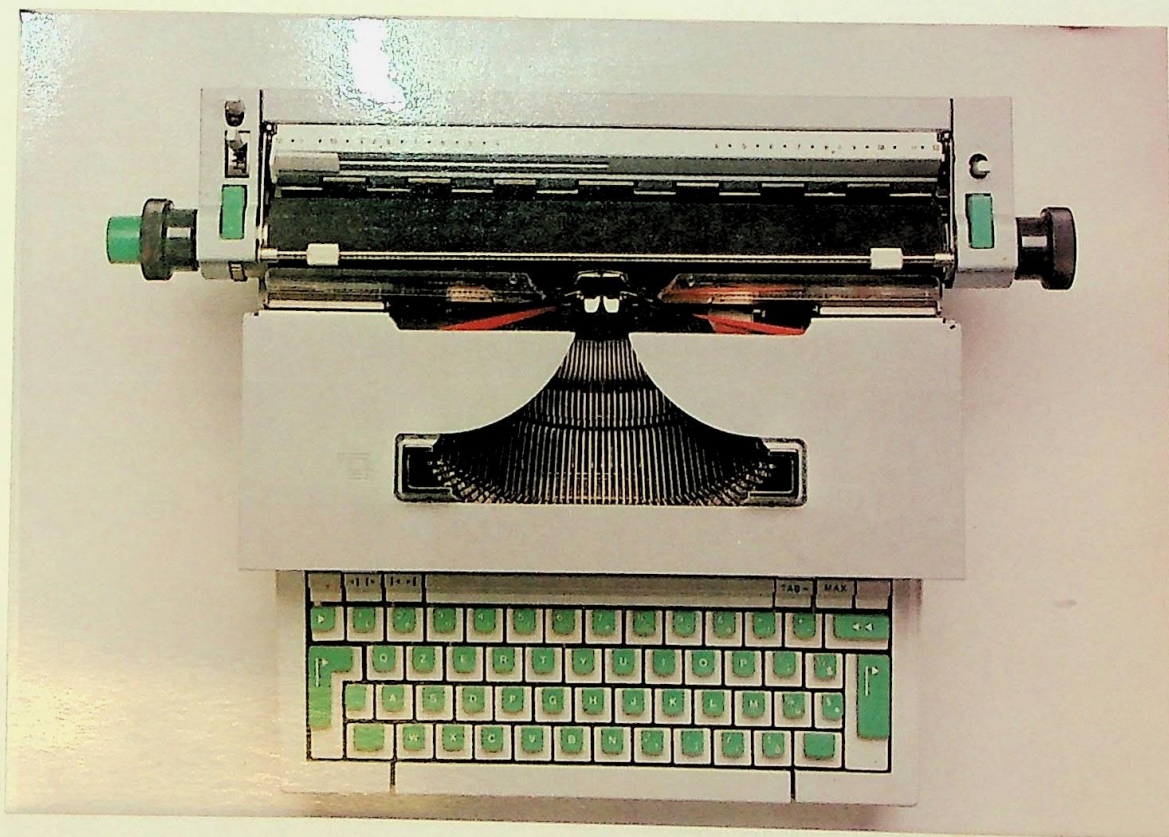


FIG. 2. THE PRAXIS 48

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a class of their own.

While Sottsass was working for Olivetti one of his first projects in the company's new electronics department was a computer called ELEA 9003. It was a complicated system: the central processing unit consisted of a series of cabinets in lines and in groups of three; in each group the middle cabinet stayed put and the outside two turned to give access to the cards. Sottsass instigated a few simple innovations in the design that emphasized his commitment to the environmental nature of the machinery. Firstly he lowered the height of the cabinets so that the operators could see each other; and secondly he created a network of aerial cable ducts connecting central processors with the peripheral machines that could grow with the system. From working with the ELEA Sottsass learned that he needed to develop a standard electronic packaging element, so he began to work on this in 1961, while also undertaking a meticulous programme of ergonomic research to evolve a group of measurements on a human scale. (FIG. 3)

In aesthetic terms the ELEA computer moved radically away from the traditional concept of "steel cupboards along the wall" and became a piece of sculpture that used mass, space and colour as its raw materials. Colour symbolism - the external wall is white with red and the controls mauve, turquoise and yellow was used to relate parts to each other and to the whole. Sottsass saw the monolithic forms of the computer providing a unit in the new family of firms that has modified the visual landscape of contemporary society, and felt that as much thought should be given to their aesthetic and



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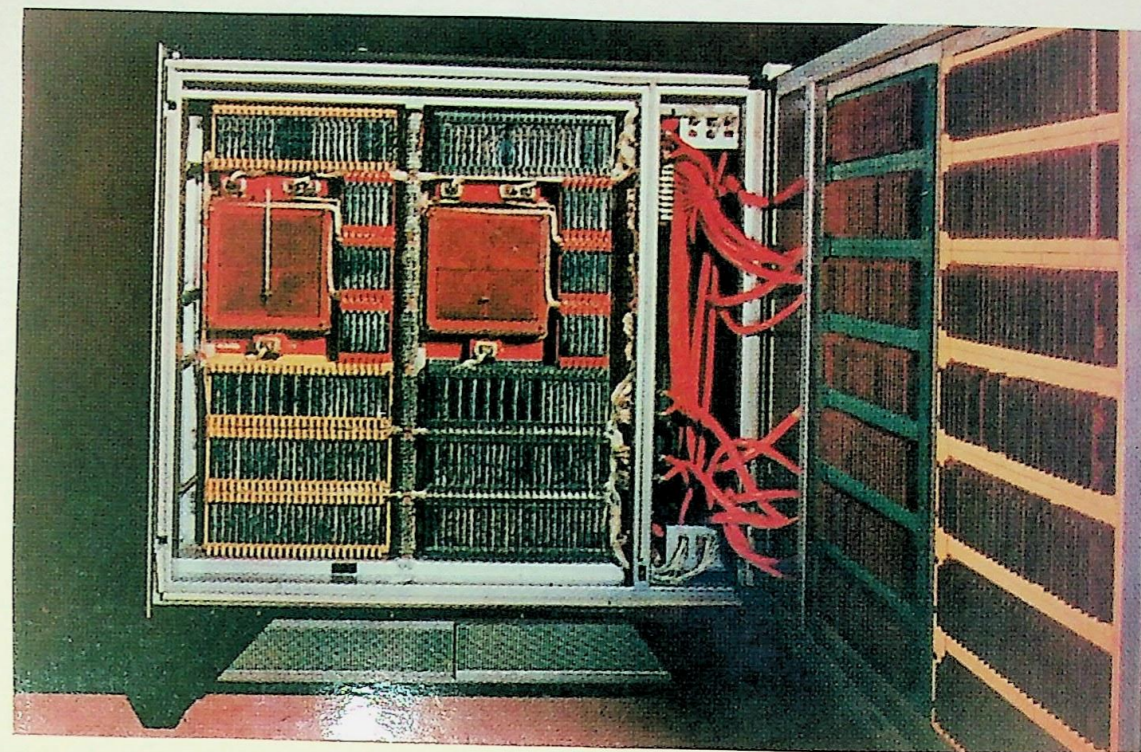


FIG. 3. ELEA 9003

symbolic content as to that of "flower-vase or a tea cup"³. Sottsass emphasizes on form of objects that interact with each other is constantly seen in his other designs. For example "a point constantly held in mind in designing the Tekne 3 arises from the thought that a typewriter like this is rarely used by itself: in most cases it is employed in offices where there are also other machines"⁴. In other words, the design of the Tekne had to take into account what happened when the machines, rather than one, are many, and the eye had to put up with many that were all alike for eight hours a day and for all the days of the year. There is the problem of the relationship between the various machines, and the problem of putting up with, or as one says today, the consumption of form. A form that has to be put up with at length, and insistently should not be too intense and should not arouse overly strong emotions or sensations.

From this point of view, the design of the Tekne should not be seen, as is usually the way, with the eye of the sculptor. It is everything but a sculpture. The design of this machine thus follows extremely elementary, simple and definite lines. These beautiful clean geometric forms of Sottsass are eloquent of the changing visual criteria which were to dominate the 1960's. Perhaps under the influence of IBM, whose high technology wares had recently benefited from the new design awareness of the parent company, there was a trend in the 1960's towards machines which were not necessarily technologically advanced assuming the appearance of sophisticated systems like large computers.

It was the example of Olivettes' impressive design programme which first influenced IBM to employ designers. The story goes that

³ Ettore Sottsass as quoted by Penny Sparke

⁴ Ettore Sottsass OLIVETTI

Thomas J. Watson, the IBM president, was driving through New York with his friend, the architect Eliot Noyes, when he saw the famous Olivetti showroom on Park Avenue. Watson wanted a corporate design policy so that his products, like Olivetti would be readily identifiable. He insisted, also, that the design should reflect the quality of the products, and he chose Eliot Noyes as a consultant to oversee all IBM design. Noyes immediately hired the designer Charles Eames and the graphic designer Paul Rand. The typewriters he kept for himself. The forerunner of this machine appeared in 1941 although IBM had been making electric typewriters since 1933, and boasted features such as proportional spacing, which allowed a skilled typist to justify the right-hand margin. The pleasing organic shape which Noyes developed for the machine has been progressively refined and has resulted in one of the recent successes of American design.

IBM 72 GOLFBALL ELECTRIC TYPEWRITER

The replacement of type-bars by an interchangeable "golfball" made little difference to the appearance of the office model typewriter even though the technology was entirely new. The invention of the "golfball" meant that all 88 characters were contained on one more or less spherical head. The only visible change this produced in the styling was that the carriage no longer moved, but the head itself travelled along the page as typing proceeded. (FIG. 4)

For twenty years the machines designed by Marcello Nizzoli for Olivetti were characterized by rounded and beveled forms. Then there was a marked change in approach, and his structures became geometrical and faceted.

Amidst all the commentators underscored the estheticizing



FIG. 4. IBM 72 GOLFBALL



taste showing direct connection with functional requirements, that characterized the Quanta and, even more the Diaspron (see FIG.5). In reply to a survey promoted by Stile Industria on the problem of the relations between industry and designer, Nizzoli states, "often especially, when the product is a complex system, the designers' job begins when the structure has been completed. And it is here that the designer, though aware of the conditions the technicians have had to satisfy, must seek their co-operation, putting precise questions to them But often the designer undergoes temptations: the most negative is to stop at a purely aesthetic conception of the product. I mean to say purely aestheticizing. It is the search for forms of taste that he attempts to impose on the product without their being necessary or justifiable. Sometimes the first image of the product is the direct result of this temptation".

A temptation in taste that not even Nizzoli seems to have been able to resist in the designing of the Diaspron 82.

THE PRAXIS 48 - 1964

Sottsass tried to change peoples views of typewriters and quite often brought a humours aspect into his designs. For example, the praxis 48 is ment to be as widely practical as possible and not necessarily to be used only by typists. In fact, as anyone can use it this machine is ideal for small offices, professionals and the incidental work in big offices.

As for the design, the fact that one can have the carriage at the same level as the machine body has made it possible to make a little box out of the machine, almost a toy, a decorative object which can be left on the table, and the fact that the mechanisms under the

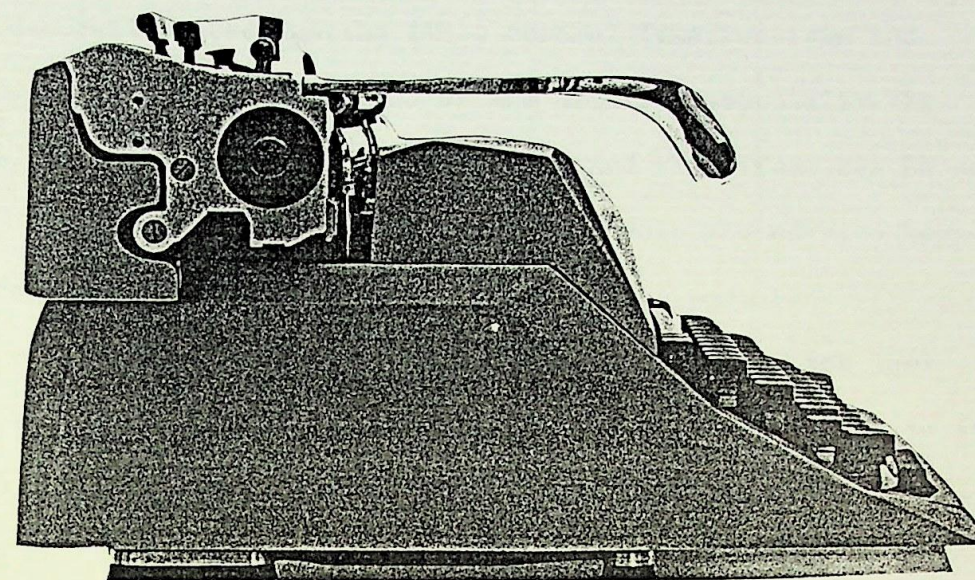


FIG. 5. THE DIASPRON 82



keyboard take little room, has made it possible to make the keyboard a kind of mantelpiece independant of the box.

The feeling of an object is appreciated even more in the precicsity of the lined surface (the reason for which is technical and not decorative, because the lines conceal imperfections and shininess in the plastic die) and of the details, especially the carriage and the mechanical parts in view; and the effect can be seen again in the humorous touch given to the controls and service keys. This idea was duplicated in the famous valentine portable.

In the 1960's ideas underwent a change. If you look closely enough and try to understand what Sottsass was trying to achieve, there is a continuity of purpose in all the things even the apparently conventional or superficially conventional office equipment. The famous valentine portable he designed in 1969 looks superficially like a neat bit of successful design, but what he was trying to do, and in fact in a commercial sense it failed in doing this - he was trying to completely subvert peoples ideas of what a typewriter should be.

It was invented for use any place except in an office, so as not to remind anyone of monotonous working hours, but rather to keep amateur poets company on quiet sundays in the country or to provide a highly coloured object on a table in a studio apartment. An anti-machine machine, built around the commonest mass-produced mechanism, the works inside any typewriter, that may also seem to be an apretentions toy.

"Seem" - but here one is aware of all the commitment of open-minded but rigorous design, which starts from a secure knowledge of good technology and in utilizing it succeeds in tranforming a



useful object into a means of expression. The two elements of the machine itself, that is all one with the handle and cover, and its container with the two black rubber hooks, are made of orange-red injection moulded ABS. Yellow, and also in ABS, are the two buttons of the ribbon spools, like the two eyes of a robot.

Following in the tradition of the outstanding and universally admired Lettera 22, this valentine is not just a more "modern" version of the Lettera 22 with revised details and alterations suggested by the state of progress of compeditor products. On the contrary, it is an entirely new typewriter which differs from its forerunner both in form and approach. It has a new, dashing and unconventional air compared with the traditional Olivetti line

Concerning the standards that inspired its design, it is worth reading what Ettore Sottsass has to say on the subject: "... an object that one takes along with one as one takes one's jacket, shoes and hat ... We designed the valentine in the belief that a biro, a hat, a jacket or a portable can also belong to a particular type of rhythm, to a catalogue of values and to the measurement of spaces or environments which are not inevitably those of property, continuity, definition and all these things, but can also be the environments, spaces, rhythms, dimensions and values of a continuous creativity, of the permanent discarding and recreation of languages ..."⁵.

A problem arose in designing business equipment as more advanced machines were being used - whether it was possible to create reproducible, standardized elements combinable in all ways - physically and in line form. Was it possible to find elementary concepts in elementary forms that make it possible to develop unexpected

⁵ Ettore Sottsass OLIVETTI



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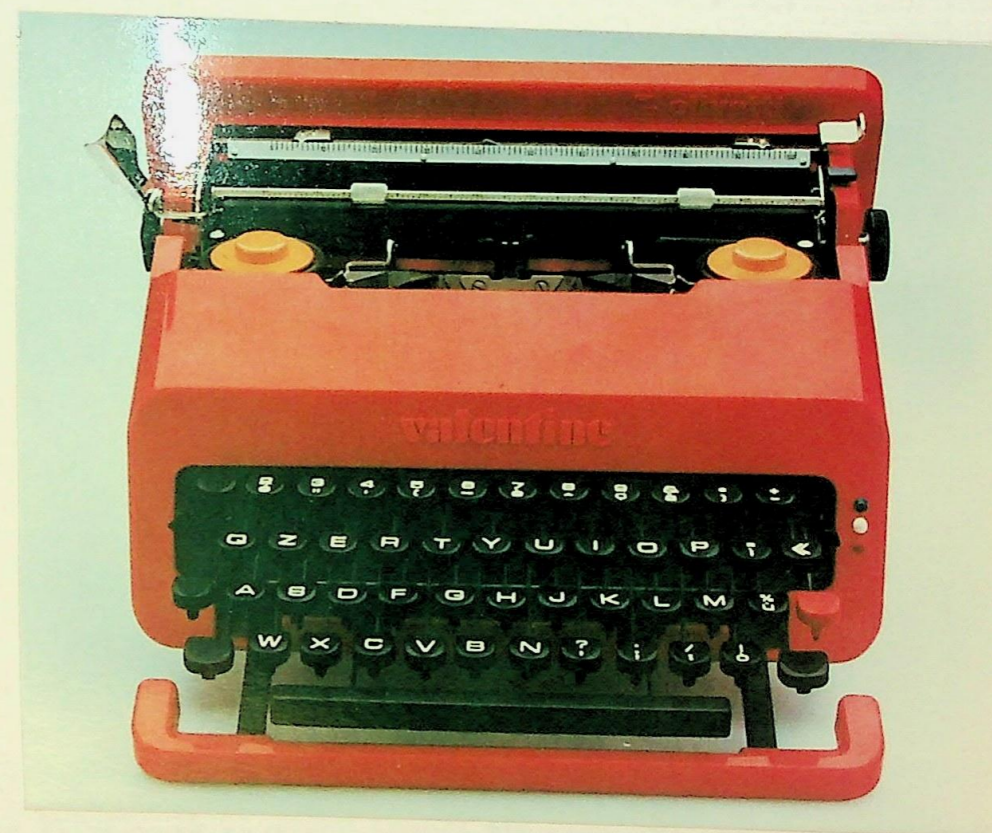
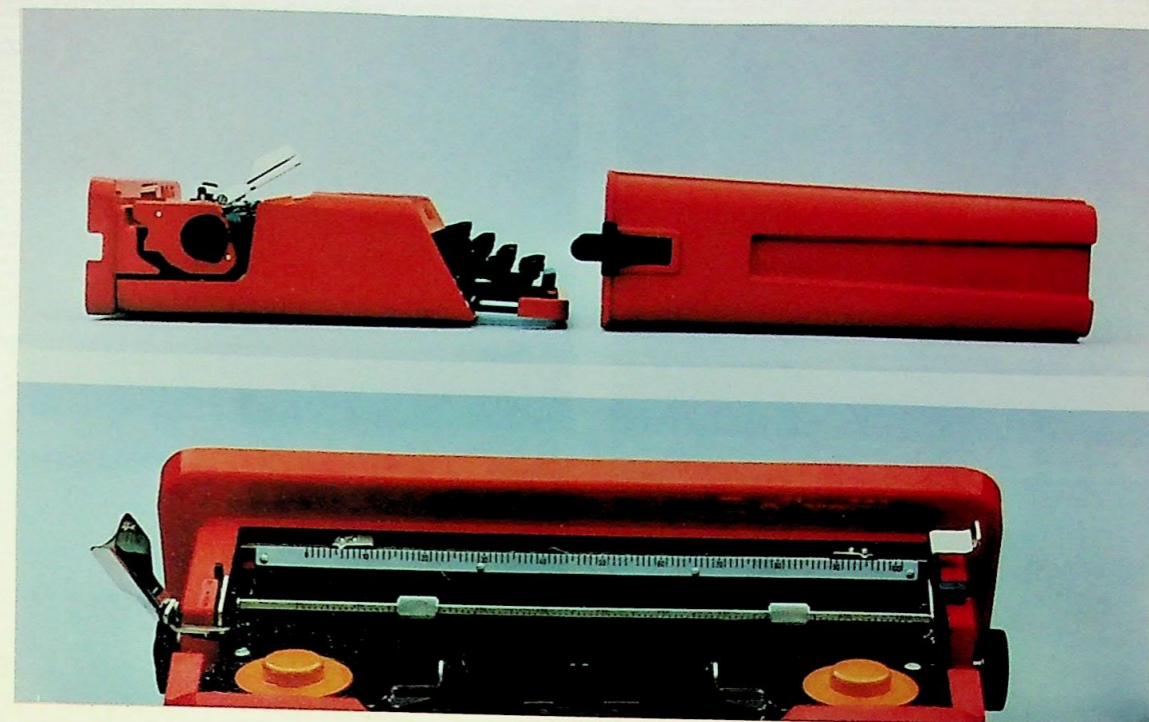


FIG. 6. VALENTINE

unprogrammed structures in a way so that in the end the whole thing doesn't fall to pieces. Even if it is not possible to know what types of machines should be added to the existing machines, it is still true that certain elements recur to a certain extent; keyboards, supports, covers that tilt back etc. and other basic elements may be added, such as colour, or connections between machine and machine, and finally a basic element of an enormous vital potency, the measure and movement of man. In other words ergonomics began to play an important part in the design of business equipment.

The P101 was the first desk-top computer in the world (1965). Its form was based on an analysis of the arrangement of its parts. The input-output mechanisms are in front towards the operator; the electronic processing "package", behind. A sheet of aluminium has been shaped to cover the works. Its-dimensionality is maintained even at the corners, points where breaks and interruptions could spoil the play of the surface. In the keys, the use of elastic membranes permitted an integrated solution of the design problem.

The keyboard has its own continuity, scanned by the horizontal and vertical axes defining the position of each key. For the operator the patterns of the keyboard areas are clearly defined, without disrupting the formal unity (FIG. 7).

For sometime, Sottsass was working towards a passive theory of design - where the finished object achieves a kind of "weightlessness" which transports it above theory and fashion. As Sottsass puts it "it wasn't so much a matter of resolving a problem but of stripping it to the bone, simplifying it, eliminating as much as possible the uncertainties, looking for coincidences or modules, or whatever, so



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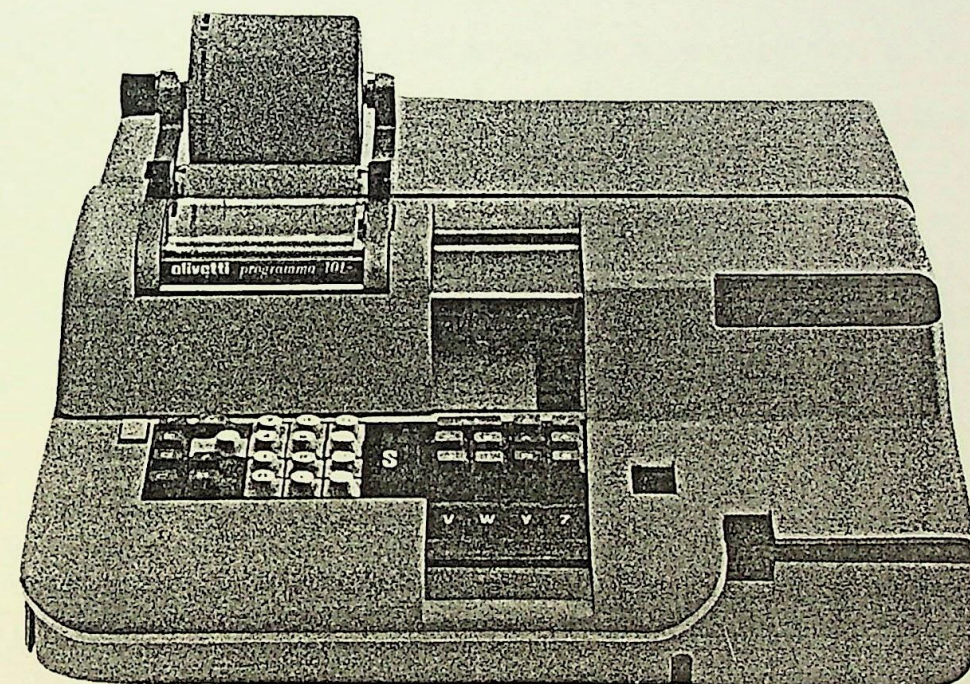
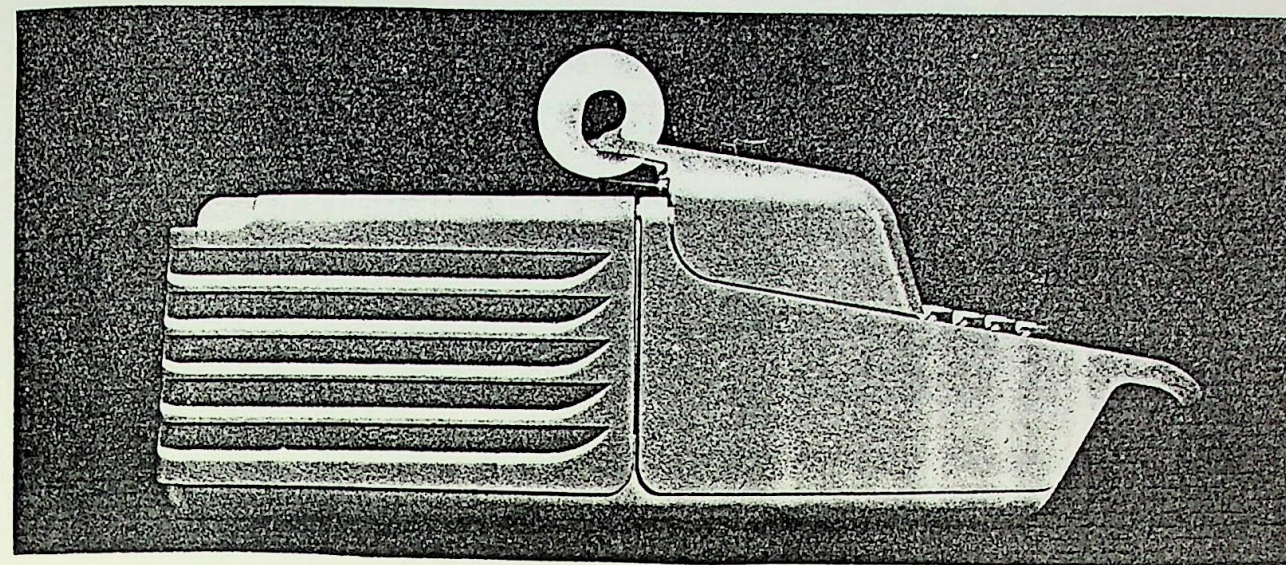


FIG. 7. PROGRAMMA



that in the end we were as far away as possible from the formal act of design. The idea was to arrive as far as possible at a mean, elementary, neutral type of design, because we felt that only like this would we be able to control the general construction of the environment. We thought we should exercise a kind of "yoga" on design, liberating shape as much as allowed as by our condition in time and space, stripping from it every attribute, sex-appeal, deception. To arrive at designing a system of elements that would go together naturally in any situation, without effort, with an almost obvious simplicity.

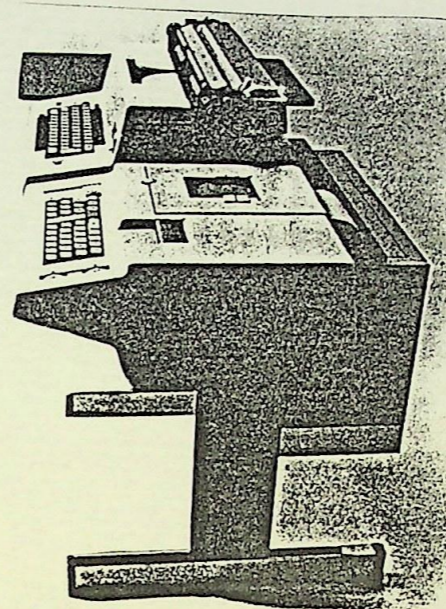
- "of machines and man" Design January 1973.

Sottsass achieved this in his design with P.A. King of the P602 minicomputer support and peripheral machines (see FIG. 8).

In the BSC business computer system the active handling of large quantities of documents (paper) at the keyboard led to the placement of a document surface at the same level as the keys, and the need to help the operator to sit more comfortably. Technological development reduced much of the apparent size of the terminal; the peripherals were contained within the machine, even though they remained as optionals. The machine became self contained.

The DE 700 work station was conceived to meet the physical and antropometric needs of the users and the operational problems connected with data entry. Thus the height of the keyboard from the ground derives from the fact that most operators work with their hands at elbow height - a position in which arms tire least all normally controlled elements, such as the keyboard, console buttons and keys, video light intensity buttons and floppy disk slots, are placed for easy access along the curve described by the hand as the

arm rotates from the shoulder (FIG. 9).





CHAPTER THREE :

YEARS OF CHANGE 1964 - 1978

These fifteen years are marked by a complete transformation of the product line, progressive change in technology (from mechanical to electronic) and constant expansion in size and markets. To say that Olivetti is now another company is not a paradox. In electronics, after the experience with the large Elea computers, a new start was made and the first desk-top computer for scientific and technical calculations, the programme 101, (see FIG. 7) was brought out in 1965 in the United States.

New models of the Editor and Lexikon (FIG. 12) classes of typewriters were produced, as well as typing systems and the ET 200 class electronic typewriters with daisy type printer and display. For the first time the single-unit element was adopted in an electric portable and the entire line of portable typewriters was renewed. In the mid-sixties the company, for many years in the forefront of mechanical calculator production, had to face the electronics revolution in that field. Deciding not to limit the application of electronic just to the display, as Japanese and other competitors had done, Olivetti converted its entire line to electronic printing, its Logos and Divisumma range of calculators now figuring in the first rank of electronic business machines.

Electronic products offer freer possibilities than the mechanical for designing shapes, resolving time and motion problems and positioning the machines. Another feature is miniaturization and the development of even more complex uses.

The life of the products tends to be briefer, while they

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diversify and multiply with great rapidity. Whereas at the time of Marcello Nizzoli they could be conceived almost as art objects - sculptures - today they have to respond to the ready modular needs of "integrated work stations", the principal requirement in machines and systems for business administration. Especially in distributed information and information systems, these products have to be designed to relate properly to other elements, such as video, display, printing devices, and other machines.

The degree of awareness, good faith and integrity determines whether work in this field, is positive or negative, advanced or retrograde; whether it leads to an improvement in life or lingers over the superannuated, the familiar, the repetitive and inert. But perhaps it is just those working daily in the field of technological innovation who feel most impelled toward an equal innovation in form and creative planning, to meet the challenge of the new times that are before us.

PORTABLE'S

Portable typewriters were originally intended for use by travelling salesman and other itinerant businessmen who needed to type letters away from the office. However, typewriter manufacturers recognized, as Sottsass had done earlier that there was an enormous market among home users. Thus as electric portables they were solid, compact objects, but also more elegant and "prestigious than the manual. IBM were ahead of the field in electrics", with their model "72". It was kept as flat as possible, rounding the corners to reduce the volume but with a vertical plane cutting the profile like a sectional metal bar. This method is very similar to that used in Olivettis' "Valentine".

The sectioning gives the objects a certain crispness that compliments the softness of the other lines and surfaces.

At about the same time Olivetti brought out two electric portables the Lettera 25 and the Lettera 35 (FIG. 10). The first creates a simple image that comes out of the deliberately schematic analysis of the group of mechanisms. Its form is characterized by the triangular element in front that follows the slant of the keyboard, thus eliminating any jog between the keys and the working level. The printing structure is covered and contained within a rectangular casing, and the carriage is lodged within the perimeter of the machine. The design of the Lettera 35 is directed more toward the demands of the market. Its sweeping lateral curves make the machines readily graspable and are pleasing to the touch.

In 1975, the first electric portable typewriters with a "golfball" printing element were introduced. The Lexikon range from Olivetti were first in this field. The Lexikon 82/83 had a moveable carriage and a fixed typing point to keep width at a minimum. The design was intended to "contain the machine", simplifying it to suggest ease and immediacy of use. The two ample curves at the sides visually reduce the height and facilitate removal of the machine from its case. The case has the basic form of a container, which folds in to become a base for the machine.

In the same year a professional electric typewriter, the Lexikon 90 was designed, (FIG. 13) and in designing it the aim was to respect and underscore that static quality, solidity, almost monumentality, proper to a mechanism of the sort. The machine was designed early in the '70s, as an updated version of the principles

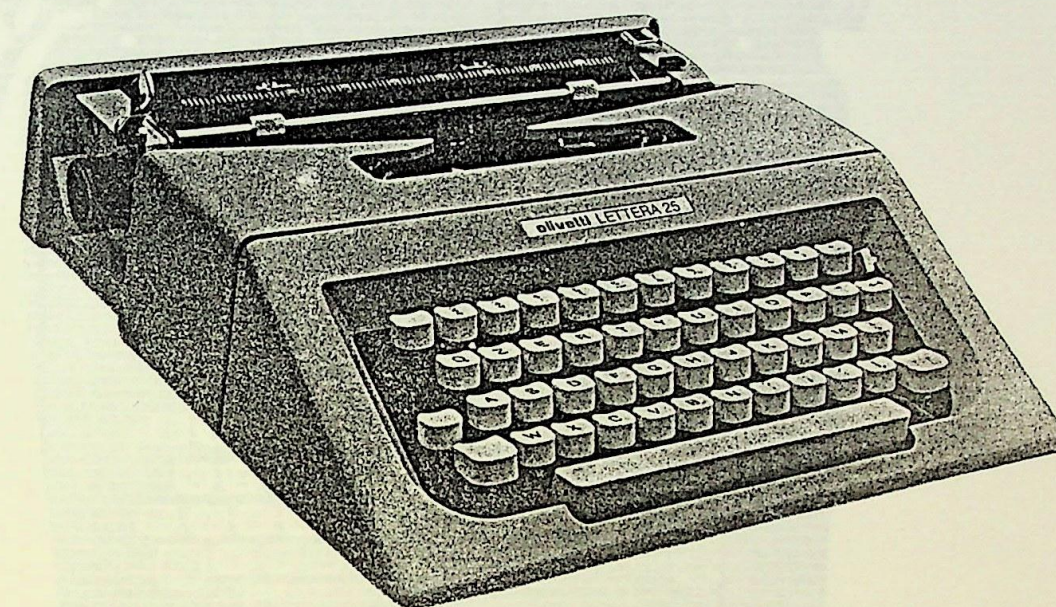


FIG. 10. LETTERA 25



FIG. 11. LETTERA 25

principles used in the Tekne and subsequently in the Editor. These principles concerned the fact that a typewriter of that kind should take the shape as much as possible of a diagram of the movements performed by the operator, so as to facilitate the work process. Ideally it was as if the form of the machine might progressively suggest the operations to be performed.

Another design consideration, already applied in the Tekne and the Editor, is that a typewriter is almost never isolated in an office space. Its shape is multiplied and the design should reflect this multiplication. The form of the machine is thus not closed at the sides, but is open for spatial continuity to create combinations with the other things around it.

As a further thought, there was the notion of reducing the scientific, technological image of the machines, and designing instead an object inclining toward the pop, with a vein of humour implying that the typewriter is not necessarily a technological status symbol.



FIG. 12. LEXICON 82

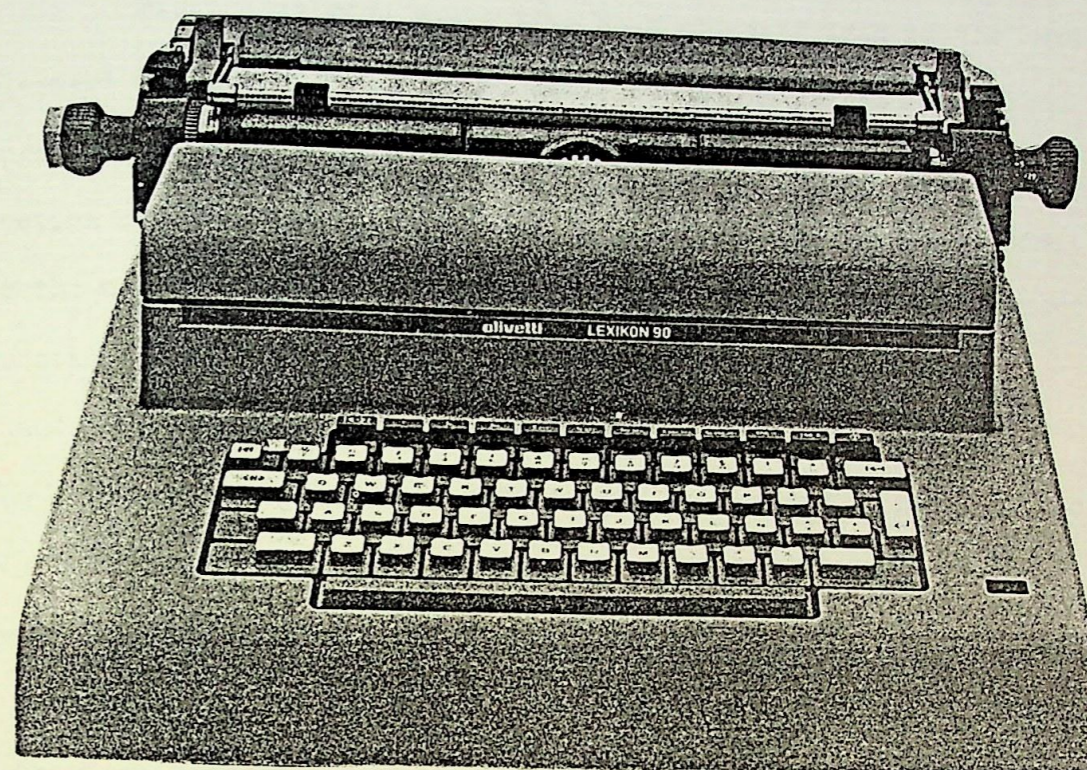


FIG. 13. LEXICON 90

CHAPTER FOUR :

THE ELECTRONIC EXPLOSION 1978 - 1983

"The problem is not that machines may come to think like man, but that man may come to think like machines"

- Lord Kelvin

These last five years have been characterized by the rapid development of the applications of electronics, which has now spread throughout the world of work and communications: from factory where production and management are increasingly automated, to the office, where the use of electronic typewriters, word processors, distributed processing and telematic systems has made it possible to reorganize work and to achieve new levels of professionalism and productivity. In the previous hundred years, office work had generally developed more slowly than production: the latter had benefited from a continuous process of mechanization applied to all areas, while office productivity rose little if at all from one year to the next. On the other hand, the numerical disparity between factory workers and office staff in industry justified the lack of attention to office productivity. But as industrial automation began to spread more rapidly, leading to a gradual fall in the number of factory workers, and as office functions expanded (design, technical work, administration etc.) this imbalance was rapidly overturned. It was time to take a new look at the productivity, rapidity and rationality of office work, and the developments of widespread electronic applications, not only in large computers but also in microelectronics for more personal, decentralized use (electronic typewriters, word processing systems, business and data entry systems, personal computers) now made this possible.

The design of an electronic typewriter reflects two considerations: the application of the latest innovations in electronics and the tradition of the typewriter with its dense accumulation of working experience, as an office aid that has become a necessity. Both appear in the image of the Olivetti ET range. The machine is flat and slender, with a slightly inclined keyboard plane that suggests readiness and ease of operation. Three motors driven by electronic groups allow separate use of the various functions.

The ETS 1010 is a completely new example of the way in which the basic office typewriter can evolve (FIG. 14). The system in fact built up by connecting a magnetic memory for storing texts, and a screen for displaying them, to an ordinary electronic typewriter. With further expansion the system can even handle texts comprising several million characters, and be employed by a number of users at the same time, by connecting up more than one keyboard. The possibility of progressively converting the typewriter into sophisticated word processing system provides valuable protection for a firm's investment in office equipment.

The first portable electronic typewriter, the Praxis 35 has been present on the international market since 1981.

A distinctive electronic feature is the "daisy wheel" print head, which makes it possible to choose from among a vast range of characters. Easily transportable, very light, compact, the Praxis 35 offers maximum performance levels and complies with the most stringent standards (FIG. 15).

All elements in the design converge to form a compact structure inclined at an angle of 13° in relation to the working surface. The

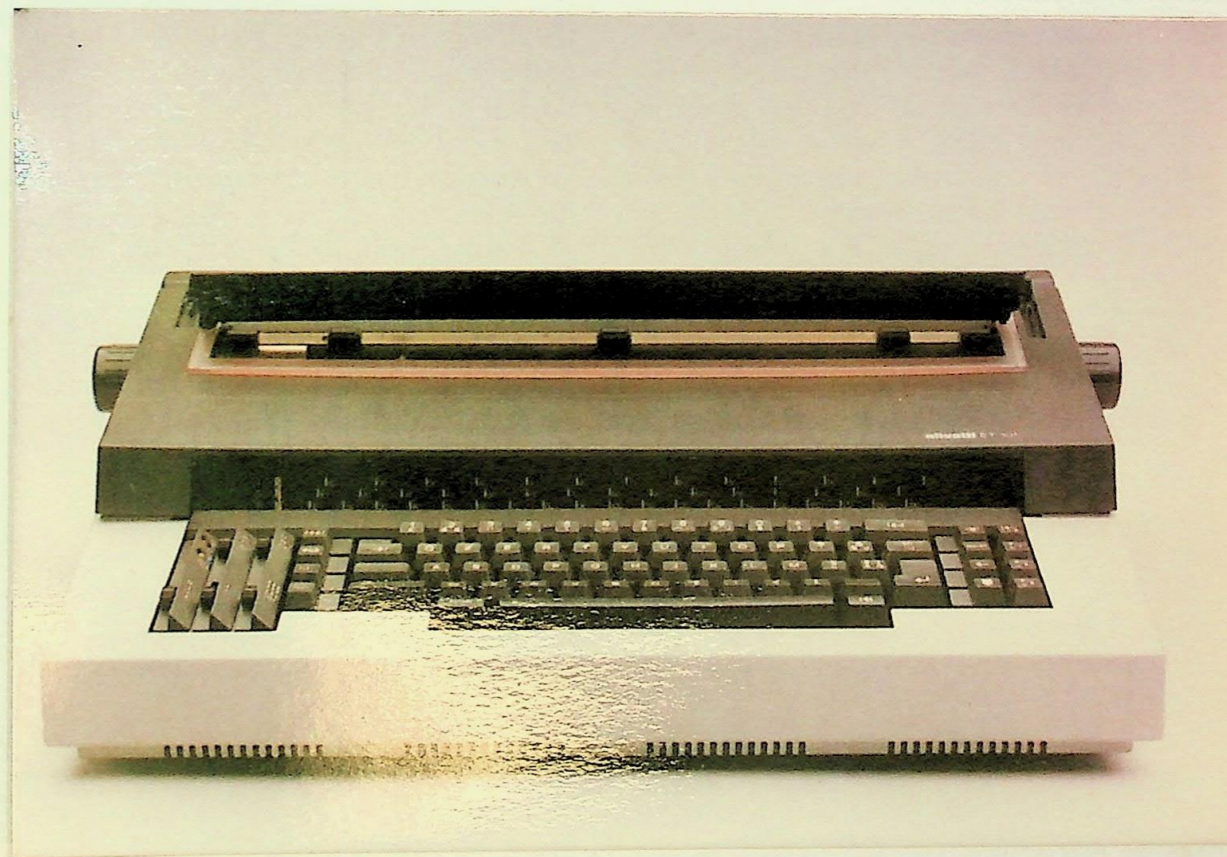
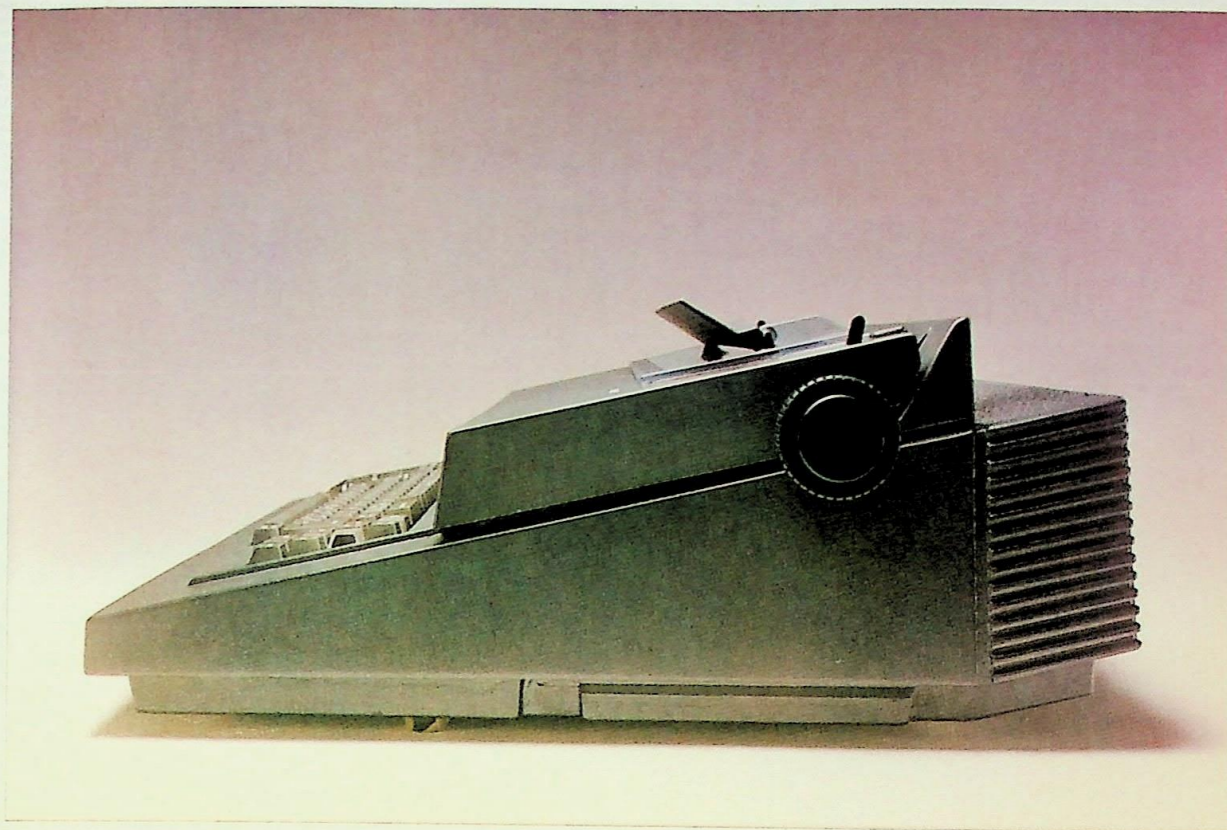


FIG. 14. ETS 1010



sloped surface provides complete support for the hand and clear visibility. Rigorous attention to harmony has produced a magnificent design which accentuates the distinctive performance features of this quality product.

The market has moved towards portable for people on the move, or for those who have flexible working hours and spend time at home. So will the office move out of the office and people's homes be transformed to offices? Have we finally come to the paperless office as mail is sent and recieved electronically?

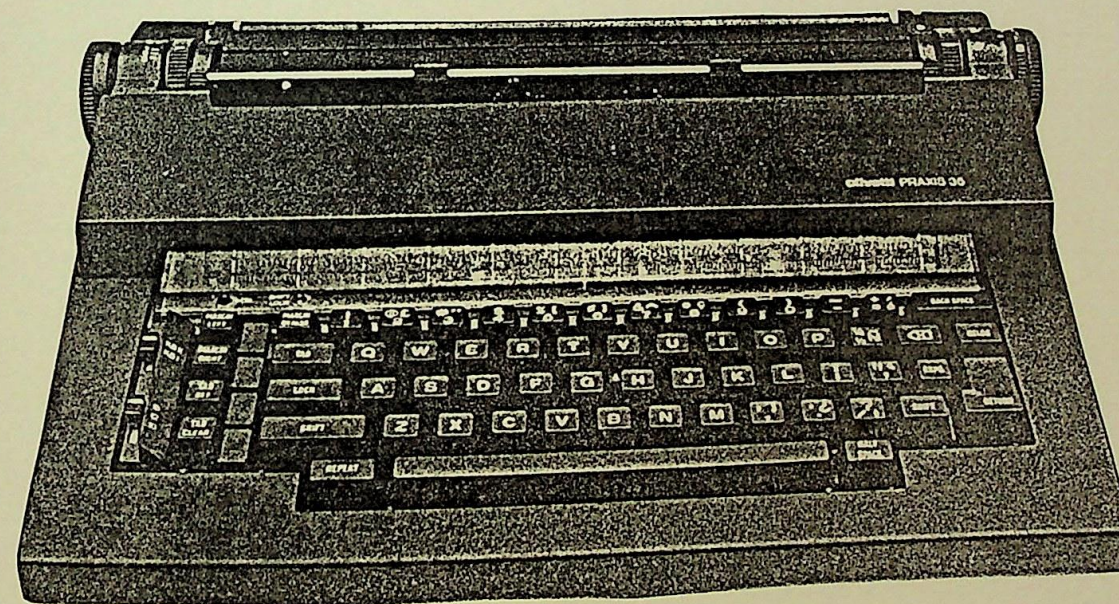


FIG. 15. PRAXIS 35

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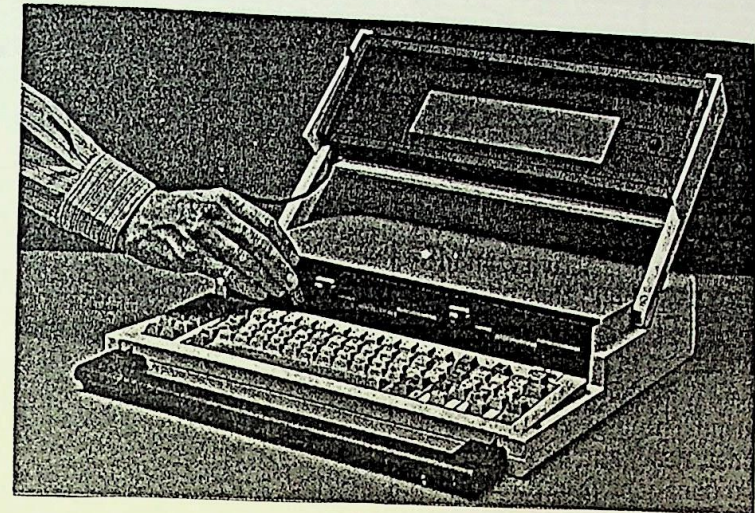


FIG. 16. THE VISUAL COMMUTER

CHAPTER FIVE :

INTO THE EIGHTIES

Computer makers are deeply concerned about the problem of "taking it with you". No, they are not talking about wealth after death, but personal computers you can pick up and carry. The market has definitely moved towards portables for people on the move, or for those who have flexible working hours and spend time at home.

Attempts at portability, however stumble over the fact that display screens and keyboards must retain some human scale. But with the Visual Commuter, (FIG. 16) the equation is solved a different way - the display screen has been dispensed with and, surprisingly, this omission makes sense. The unit is compatible with the IBM PC, but has no screen at all. It does, however, have a video part to which you can plug a monochrome or colour monitor. The idea is that you could have one monitor at the office and one at home (or where-ever) and carry only the computer back and forth. But if you spend more time someplace in between, you can fall back on either a 16- or 25- line optional LCD screen that costs more.

When packed, the computer looks like a metal briefcase that's somewhat broader than average. It's not exactly a feather-weight package at 20 lbs, but briefcases are often heavier. A sturdy hinged handle encased in hard rubber eases the job of carrying the computer.

To use the machine, you lay it down with the handle toward you, push the latches on either side, and swing the keyboard cover up on its hinges, revealing the keyboard and disk drives. Most

of the other portables on the market are briefcase sized or smaller. But a glance at the commuters' keyboard shows one reason why the commuter is bigger - the keyboard is a full-size replica of the IBM PC keyboard. Most of the other portable manufacturers have made their keyboards smaller by putting the function keys along the top and doing away with the separate numeric pad.

The portable market has become a sizable subset of the entire personal computer industry, ranging from transportable units like the sharps (FIG. 17) down to kneetop items like the Husky (FIG.18). The transportable types generally rely on standard CRT monitors and so remain to bulky for true portability. The kneetop systems have achieved true portability but don't pretend to do everything their bigger cousins do.

The problem with these products is that little or no attention is paid to human factors and aesthetic considerations - in comparison to their forefathers - except on a fundamentally utilitarian level, as well as integration of all parts of the system. That is to say that the object is treated as a collection of elements and while some manufacturers/designers pay some attention to that shell - radiused edges, vent detailing etc., they are really opting for the most functional solution, rather than one that is both functional and aesthetic.

Possibly, the current designs are as they are, because at the moment, computers appeal to a market limited to scientists and business users. The designs conform to a preconception of what computers should look like - metal boxes with vents, and the users are primarily concerned with what they do and not what it looks like - for example,

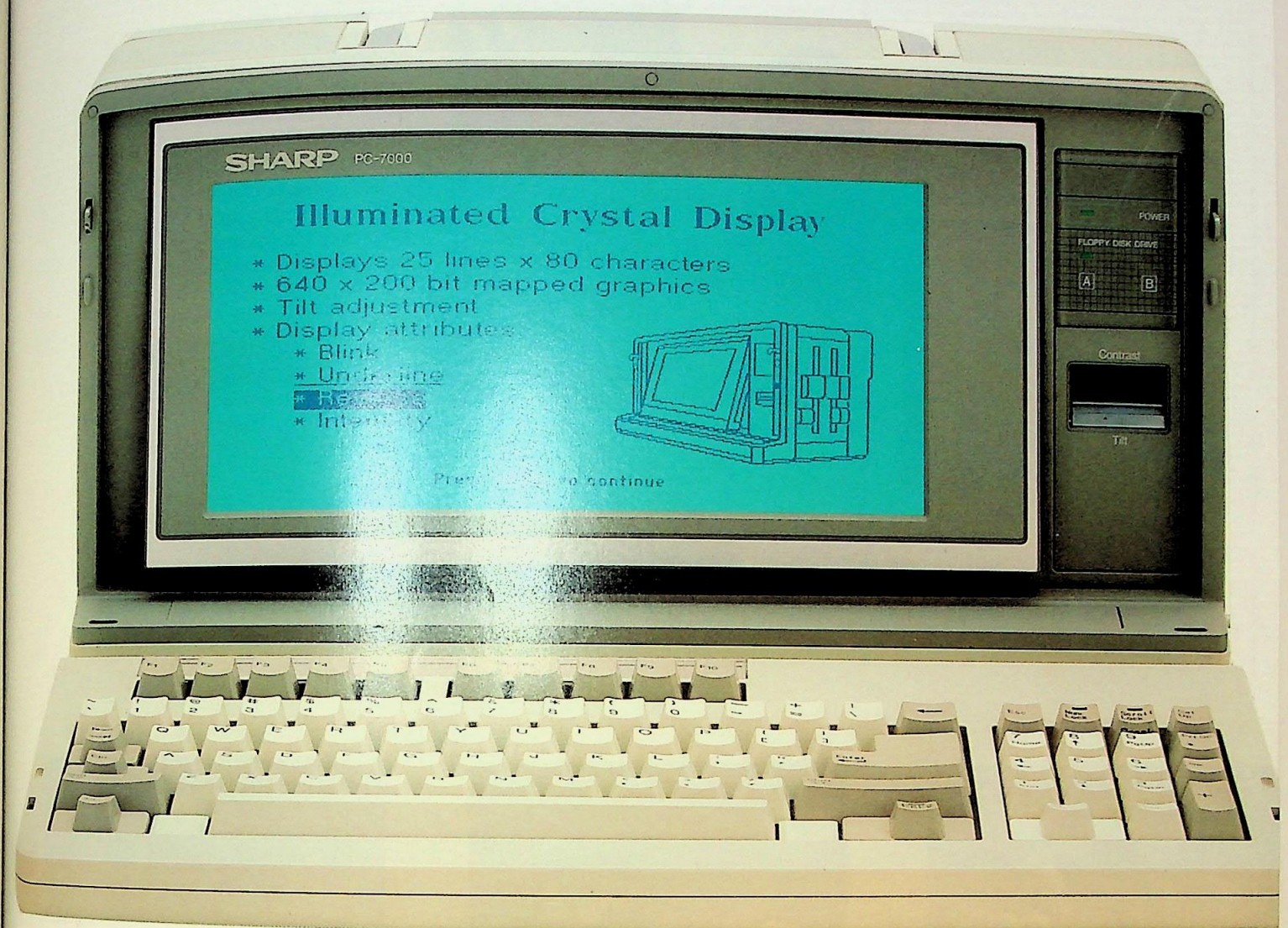


FIG. 17. SHARP PC-7000

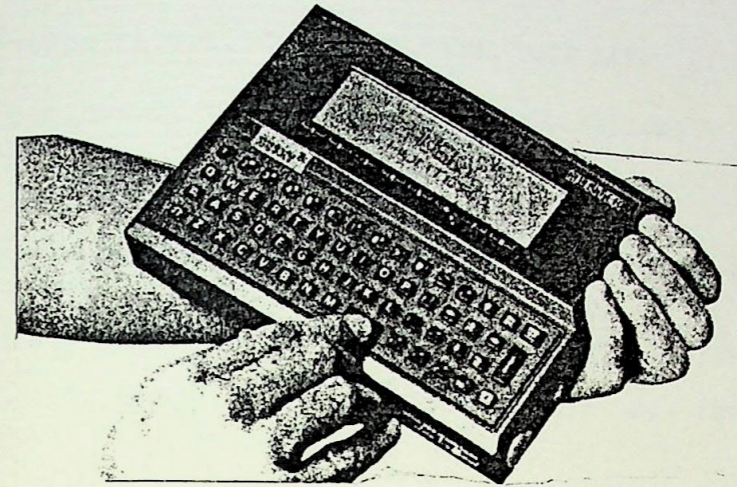


FIG. 18. HUSKY

the sharp MZ-5600A series (FIG.19). However, the market for computers is now opening and they are becoming cheaper and therefore more available. The man in the street is already becoming educated in design sensibilities, one has only to look at domestic appliances such as irons, electric razors, coffee makers, and other products that have already been mentioned, to see that good aesthetically pleasing design is expected.

The same will be true of communication systems; users will expect to see ergonomical designs that are comfortable to operate, screens that are easy on the eye, that symbolise their use, and the consumers aspirations.

There is a gap in the market here - to design a system which displays a sense of friendliness and which would not look out of place in the home.

As the market place becomes more and more competitive, it will be the ones that look good, integrate well, and function well that will succeed. To design an aesthetically pleasing machine can be done without major budget increase and is a necessary anticipation of marketing trends in the near future.



FIG. 17. SHARP PC-7000

CHAPTER SIX :

THE DESIGNER

QUOTE FROM VICTOR PAPENEK -

"When you make a thing, a thing that is new, it is so complicated making it that it is bound to be ugly. But those that make it after you, they don't have to worry about making it. And they can make it pretty, and so everybody can like it when the others make it after you"

- Picasso (as quoted by Gertude Stein)

Perhaps no category more than that of business equipment better exemplifies how the design industry has benefitted from the recent growth of communications technology. As telecommunications have made the world a smaller place, it is designers who have helped to make this transition a comfortable one. As the complexities and capabilities of business equipment increase, so too, in direct proportion, must their simplicity and ease of function for the user. More and more, it is a case of simplicity undercutting complexity.

Ease of operation is vital not only because of the growing capabilities of much of this equipment, but also because of the varied levels of electronic literacy of its users. One apparent feature of contemporary business equipment is its compactness. Designer input is integral both to equipment which combines different communications functions and equipment which has simply become smaller, or even minaturized. (FIG.20). The growth in the variety of products which can be accomodated by the briefcase is matched in number only by the challenges they present to the designer.

A second and no less important feature is compatibility. Whether it is the business itself that is expanding, or the business's need and use of electronics, or both, component systems which are



FIG. 20. WANG PORTABLE

designed to be updated to accomodate new equipment have a "clean edge". And, as electronic literacy is on the rise, users demand new capabilities. Systems which can respond to this sophistication are meeting a real market demand. Compactness and compatibility - often approached simultaneously - are surely the two keynotes in the design of contemporary business equipment, and computer design is of course, the most active arena for their development for example, The Apricot portable (FIG.21).

Clearly, the domain of the industrial business equipment designer has grown in recent years. Colour, texture, material and system image are no longer the only areas that answer to the designers specifications. His considerations have grown to include size, ergonomic adjustability, modularity within the system and compatability to other systems to name a few. And as design in this category becomes more an issue of product development than of styling it also becomes a research based process. But on the other end, these same designers are becoming involved with marketing their products. Because the design strategy begins at an earlier stage, it is not surprising that it should be continued into a later one as well. That is, as the design strategy becomes more integral to the overall business strategy of a product, it has as much a place in marketing as it does in product development. Out of necessity, designers working in this field of equipment have become literate in new areas, recognizing the fact that sales may come to depend upon their recognition of design as an interdisciplinary medium. What all of this suggests is not simply that the context of the design profession has grown here, but that its lead may well be followed elsewhere.

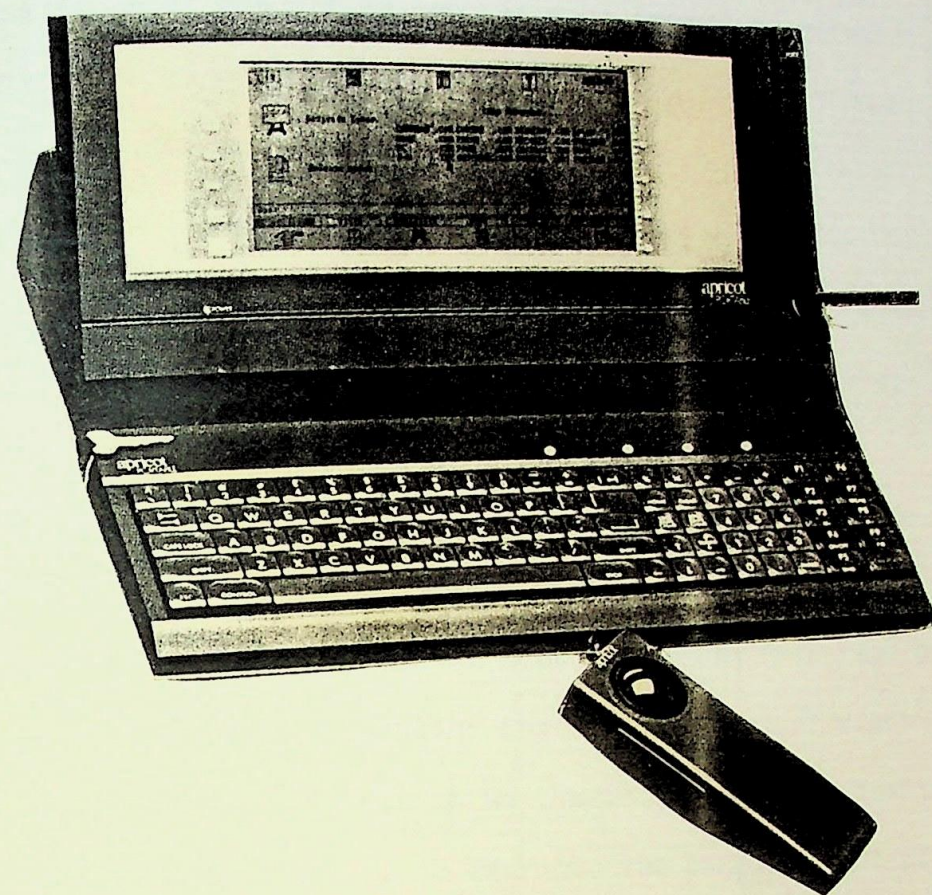


FIG. 21. APRICOT PORTABLE

National College of Art and Design
LIBRARY

In many cases, product designers have gone on working in the same rationalist mode as they always have, putting everything from washing machines to radios in basically the same boxes, and ignoring the expressive possibilities of design. But the changing climate could not fail to affect them in the end, given that so many of the underlying assumptions of product design had come from those pioneers of modernism whose architectural theories were coming in for criticism. At the same time, technological advances have tended to substitute minaturized microprocessor circuits for mechanical moving parts, thereby removing many of the functional constraints that had previously underpinned the formal types for various products. Many designers have begun to show a greater interest in the symbolic and expressive potential of products, leading them to look for alternatives to monochrome uniformity (FIG.22).

It is now taken for granted, that a Japanese tape-recorder, for example - once considered miraculous now a commonplace of electrical wizardry - will function well. There is no longer any need for designers to style a product in such a way as to reassure the consumer that it works efficiently. Instead, products are styled to look like playful toys, maximising the potential for pleasing in manipulating their working parts. Pastel colours, highly tactile controls and eccentric typography have taken the place of brushed aluminium, aggressively textured knobs and a profusion of dials. The latter were once used to suggest precision and reliability: now that reassurance will often be off-putting to the increasingly sophisticated, visually attuned consumer. Many products look more playful, such as Sharps' ice-cream coloured T.V. sets and radio cassette players (FIG.23).

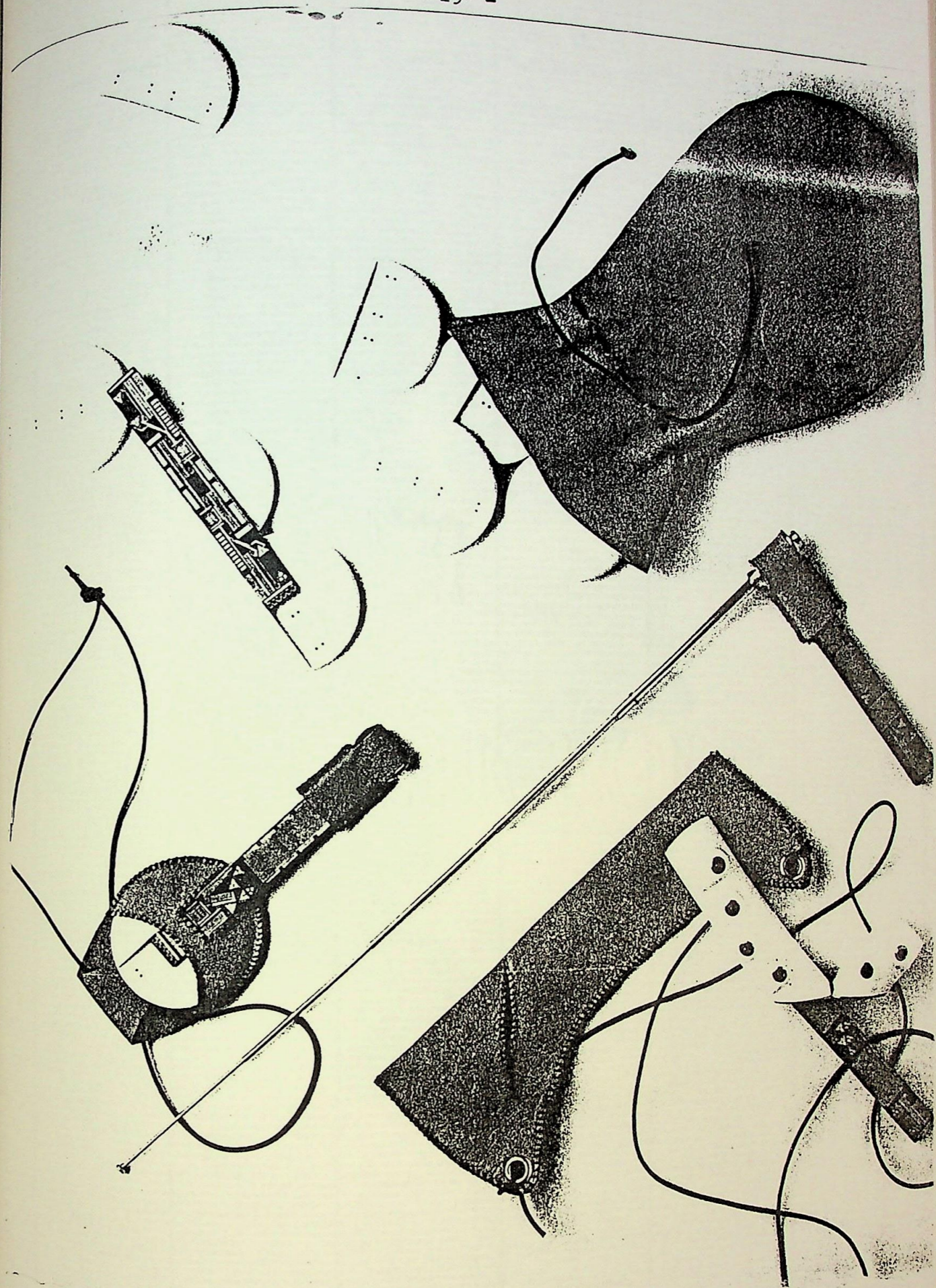


FIG. 22. MINATURE COMPUTER

A wider range of colours and more expressive shapes are being deployed
in the attempt to create more suggestive and saleable products.

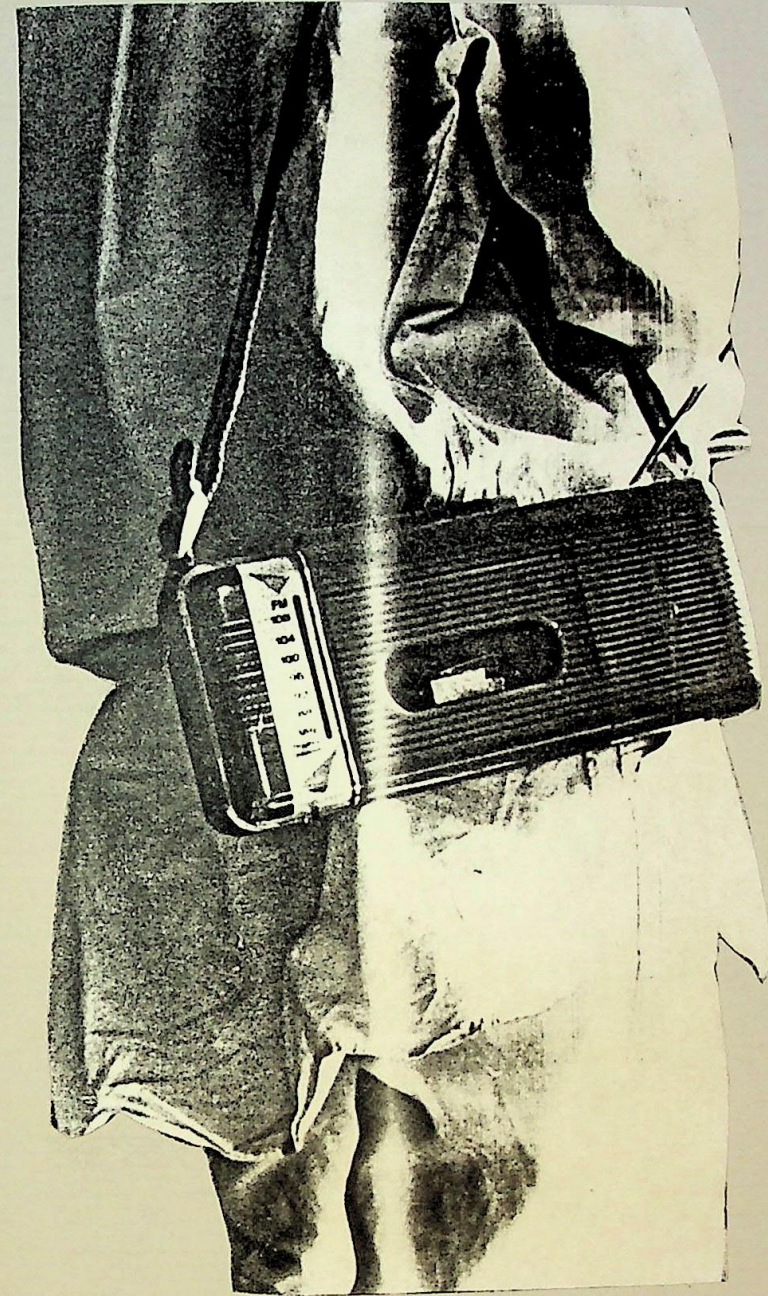


FIG. 23. SHARP RADIO CASSETTE PLAYER

"Here is the machine isolated in time and space from everything else in the universe. It has no relationship to you, you have no relationship to it, other than to turn certian switches, maintain voltage levels, check for error conditions and so on"

- Robert M. Pirsig,
Zen and the art of motorcycle
maintenance.

What will the office of the future look like? In the short term, not too different from the office of today, with office workers continuing to pile up paper by the lorry-load.

A US high technology market research company, the Tankee group, has estimated that there are eight filing cabinet drawerfulls of paperwork for wvery white collar worker in America, and that this paper mountain will continue to grow, in the foreseeable future, at a rate of two more drawers, per person, per year. So far, most of the innovations in the office - copiers, computers, and word processors - have only helped that rate to grow, not to decrease.

Ask a business equipment maker, a computer manufacturer, or Telecom Eireann, what the automated office will look like, and you will be given a different, but convincing answer from each. It usually explains how their own products or services will form its centrepiece. As if this were not confusing enough, it is, in fact, by no means clear who will be the important office equipment suppliers. Fifteen years ago, around the time that IBM coined the expression "word processing", nobody could have foretold that the leading suppliers in this important field would be companies with names likg Wang and AFS. For the wise designer, there can be just one course of action: Be prepared.

For the average office, one trigger to the future still

lacking is - money. There is little doubt that, for all the recent calls for robots and "steel-collar" factory automation, actual investment for increased productivity has been lagging spectacularly. From 1969 to 1979, office productivity crept up by just four per cent while that on the factory floor rose by 80 per cent.

This has been due to the past century's slow progress in office technology. Apart from the wide use of the telephone, until the seventies, there had been no universally applicable office productivity innovation since the first Qwerty typewriter, a Remington, entered mass production exactly a century before. Anyway, not only have most of the developments of the past 10 years actually increased the rate of paper production, they have failed to help ensure that this explosion of information is read, or understood.

WHO SAYS WE DON'T NEED OFFICES?

The key technologies of the office of the future concern communications, storage and what is sometimes termed telecomputing, the merging of communications and computing functions. Developments in telecommunications technology in the next ten years mean that, as has been well publicized, working from home through televised auto "teleconferencing" could become feasible - though not necessarily desirable, quite simply, not everybody likes working in isolation, even though travel costs are shooting upwards. (I will refer to audio conferencing in a later chapter).

The other doubtful, but potentially significant development is the laser disk, currently fashionable technology for electronic filing cabinets.

The laser disk first emerged in the guise of a method for

at home play back of pre-recorded video material. It should indeed be a highly compact and technically straight forward way of storing information in an office environment. One of the LP record like disks can store the same amount of information as 2500 A4 pages; but these disks proved difficult to make and a lack of interest was shown by potential customers.

AS FOR THE FURNITURE :

Whatever electronic storage medium does emerge to challenge the filing cabinet, there still remains the key question how do users get to it? One answer often is something called the integrated multifunction work station.

Such devices appear, from time to time, at computer exhibitions, looking as likely candidates for office use as a cinema organ. Most of the components of the workstation, such as display screens and storage devices, are just too bulky for easy integration. For the foreseeable future, anyone who wants to get to grips with the electronic office will have to do so through a computer terminal (keyboard and screen).

Besides equipment suppliers, the other people with a firm stake in the future are probably open plan office furniture suppliers. According to the economic forecasting company predicasts, the flexibility afforded by open plan furniture will mean that by 1995 traditional chairs, desks, and cabinets will account for barely half of furniture shipments in the USA, with open plan systems accounting for the other half.

Offices will be nicer too, according to one of the few all-British books into "the structure and design of tomorrow's office".

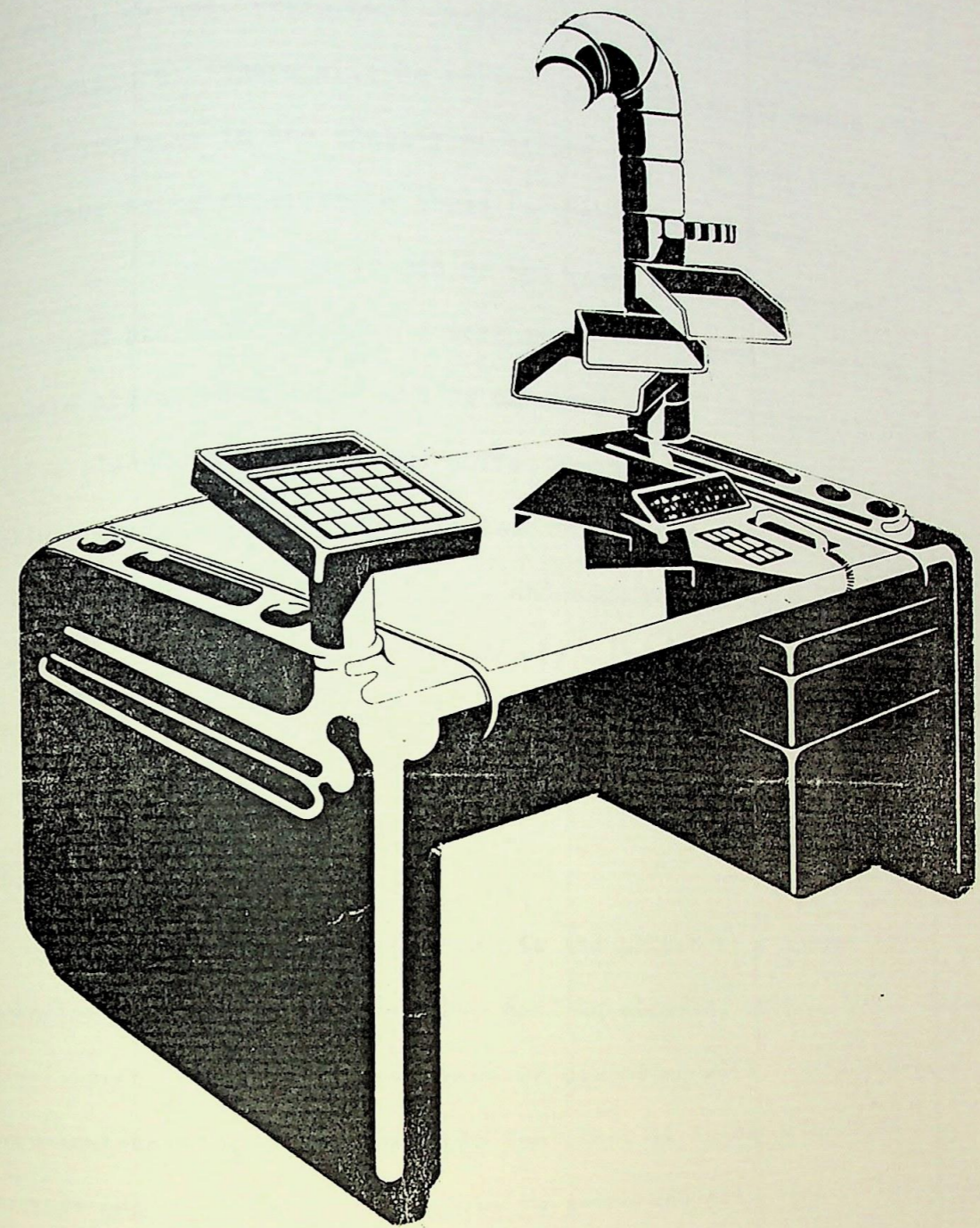


FIG. 24. FUTURISTIC DESK

This was published in 1980, from the results of a survey carried out for Milton Keynes Development Corporation. The conclusions painted a rosy picture: "There will be better office design all round with a general increase in the quality of office life - in many offices, conditions being superior to those in the employees homes...."

"The concept is one of the right sort of open-plan", landscaped and with curves - a sort of "office street" containing senior managers areas, middle and junior managers areas, open and secluded meeting places, relaxation and coffee areas, secretaries areas and machine rooms. Secretaries will undoubtedly all have terminals will be common place within five years, and some senior managers may never have them. However, though the secretary, information will be instantly available.

Perhaps things won't be so different after all.

INFORMATION TECHNOLOGY :

Information technology is the phrase that covers the technology of communications; the sending storage, sorting and retrieval of - information. The convergence of computing with vastly cleverer communications technology and the fact that it is becoming both possible and economically feasible to represent all forms of information - voice, pictures, measuring alphanumeric characters - by stream of binary digits means that I.T. is going to be as familiar to the developed world as electric light.

And as useful? We know that the equipment on which I.T. is based has become cheaper year by year; that children love the technology and get on with it better than many adults; that it puts

people out of work in some sectors, creates new employment in others and has a shortage of people in the most crucial area of all: software. Also, that the question of its possible rejection has so worried governments for the past 10 years that all have put a great deal of money into encouraging its adoption.

Industrial designers already know how much work will result from the adoption of micro electronics. Product design of both capital equipment and consumer goods, office design and the design of goods incorporating spin-off technologies like fibre-optics and opto electronics.

It would be ridiculous of the facts, however, to pretend that there isn't a problem. That problem is the inexorable sense that the world is gradually dividing into two unequal halves: that of the technocrats and that of those who feel they have lost their working identities, are losing democratic access to information and are either excluded from having a share in the new world or are likely to be turned into slaves of intolerant, expensive machines.

Some things are more important than others in reassuring people about I.T. The rush of personal computing into the home is one - the machine you can play with is fun. The move to put a micro processor in every school is another. But it is the fear that the needs of machines are dominant over those of people that needs to be dealt with most, and not by camouflaging it. There has been too much talk of the paperless office, the robot-inhabited factory, the machine-minding machine. If industrial and interior designers involved with I.T. can help promote the right of humans to be involved, to take responsibility, it would be the best thing they could do.

Isn't part of the message of the post-modernists that what people actually like is better than what makes them most apparently efficient? And isn't what is needed more research about how to make machines and machine-based systems more sympathetic to human needs; more compatible with human behaviour and more satisfying for people to work with? Only if technologists discoveries and marketing mens' ambitions turn into useful, attractive products. Will it be able to be counted a success - for what we want are humans, not ghosts, in our machines.

COMMUNICATIONS :- THE FUTURE

The future of telecommunications is especially vulnerable to emotive speculation: combined with computing, it becomes the harbinger of the post-industrial society. Arthur C. Clarke for example, foresaw the communications satellite. Elsewhere he wrote "... what we are building now is the nervous system of mankind which will link together the whole human race, for better or worse, in a unity which no earlier age could have imagined". At the same time he said "... there are no wholly beneficial inventions".

At the turn of the century H.G. Wells, the father of technological forecasting, foresaw ... "many Londoners in the future may abandon the city office altogether preferring to do their business in more agreeable surroundings". In 1911, E.M. Forster wrote in his story *The machine stops*, "imagine if you can, a small room, hexagonal in shape like the cell of a bee". In his room is a woman ... with face as white as a fungus. It is to her that the little room belongs. He continues " ... there were buttons and switches everywhere ... buttons for food, for music, for clothing. There was a button that produced literature. And of course there were buttons by which she communicated with her friends ...". "The clumsily system of public gatherings had long since been abandoned". Towards the end of the story comes the final denouement ... "There came a day when, without the slightest warning, without any previous hints of feebleness, the entire communication system broke down, all over the world, and the world as they understood it, ended ...".

Clarke, Wells, Forster, Orwell; differing views at different times of the communications future. Most of the technology



FIG. 25. GEORGE ORWELLS VISION

they foresaw already exists, but the future they foresaw does not. Perhaps they gave us a warning which has prevented us; or perhaps they were just plain wrong.

The "expert" when forecasting is so often wrong. He so often underestimates the resistance to change - be it political, social or commercial. Consider the picture phone AT and T forecast in 1970 that in the USA by 1980 3 percent of all business telephone sets and 1 percent of all domestic sets would be picture phone - some 3 million installations in all. In the event there was more.

Whilst it is easy to overestimate the rate of adoption of new technology, it is almost impossible to anticipate radical changes in technology. These can emerge surprisingly quickly. For example, it is only in recent years that the phenomenal capabilities of optical fibres have been appreciated.

By now all this has perhaps convinced you of only one thing. Anything that is said about the future will be wrong. With this discomforting background I will nevertheless press ahead.

Let us start with a look at the present. Whilst the underlying technology of telephony has changed greatly in the past 40 years, the nature of a telephone call has hardly changed at all. The quality has improved a little, especially for an international call. Push buttons are replacing the dial, colour range is vast, and the styles and types are never-ending. But a telephone call now is little different from one 40 years ago.

Contrast this with computing. In this same period we have moved from the construction of the first ever computer to the era of the all pervasive microprocessor.

Why this contrast? The answer lies in the fundamental nature of telecommunications. It is essentially a network that must work to common standards. Developments have to be built upon the superstructure already in place. The new has to be added carefully to the old.

It emerges that the next 40 years will see much more dramatic change than the past 40 years. This springs from three fundamental developments in the underlying technology. First, optical fibres. The use of light as the carrier through fibres of glass is a truly dramatic step forward over the use of electricity as the carrier through copper wires. The dramatic possibilities lie ahead with their bandwidth, that is their capacity to carry huge volumes of data, is brought right to the subscriber - to the home, the office.

Second, communications satellites. Their true potential is as yet hardly tapped. It lies in the simple fact that any one geostationary satellite can "see" one third of the world at any one moment, and can be "seen" by the same one third. It follows that, in principal, it can instantaneously switch information from anywhere to anywhere else within its view - the telephone exchange in the sky.

The third fundamental development, more important even than the other two - for without it they could not exist - is micro electronics. The continuing shrinking in size, increase in power and reduction in cost in electronics pervades all technological development. Communications is not exception. What changes in service can these technologies bring about? Here are a few suggestions.

Electronic mail : There will be complete interconnection via networks of message terminals in the home and office. Through this network personal computers will communicate with each other, and with

huge information files.

Video Communications : The picture phone, so long delayed, will come at last. At its simplest this will allow the traditional two-way call to have full colour vision with voice. It will also allow multiple calls, with three or more places communicating at once - remote conferencing.

Do not think of this as limited to us peering into screens. Holography will allow full three-dimensional remote conferencing. To quote Arthur Clarke again (writing 20 years ago) "... The business lunch of the future could be conducted perfectly well with two halves of the table 10,000 miles apart; all that would be missing would be the handshakes and exchanging of cigars". I might add you could not within the foreseeable future pass the salt.

Next, the mobile phone : Today we think of the mobile phone as luxury, the requisite of the business tycoon, reclining in his rolls or mercedes, calling his office, always in touch. Today's idea of the mobile telephone is the phone in the car.

This is not the future I have in mind. It is more like Dick Tracey and his famous two-way wrist watch, or the device that allows M to reach James Bond where-ever he is. We shall each be able to have a unique code and be reached where ever we are. To quote Clarke again, "The time will come when we will be able to call a person anywhere on Earth, merely by dialling a number". He goes on to say, "This device alone may change the patterns of society and commence as greatly as the telephone, its primitive ancestor, has already done".

Perhaps you think these new services are in the realm of

science fiction - after all I am quoting liberally from one of the great writers of science fiction. But no fundamental breakthroughs in technology are required. The essential components exist.

When these new services come into widespread use, what effects would this have on our work and leisure environment?

The key change will be telecommunications substituting for travel. In theory this should have happened already, but there is little evidence of it's having done so. International calls have increased very rapidly compared to inland calls. But then so has business travel increased. Perhaps this has been slower than it might have been. My personal experience is that a business phone call very seldom substitutes for a meeting. This will change, but only with the use of full video conferencing in the place of work. Visual contact is a very important part of communications - without it, much is lost. But with it we could move to an era when, to quote Clarke again, "The business of the future may be run by executives who are scarcely ever in each others physical presence. It will not even have an address or a central office".

The most exciting possibilities are not in the way that executives will change their work patterns, but in the way that communications, combined with computing, could change the work patterns of the whole community.

If we believe in this future - and I see no alternative - than this has many implications. We can and should look forward to a society with much less time spent in work as currently characterized. Much more of this work will be based in and around the home, and we can expect the machines we will use to be less aggressive and threatening and much more friendly. Computers will design themselves, and if

designers of business equipment are still working, then they will be redesigning business equipment for use in the home.

CONCLUSION :

Typewriters have been in existence for a century now. Like so many other inventions they are now completely taken for granted and the revolution they have created in the business would pass without comment.

The story of the changes brought about by these machines is an absorbing one, replete with strange and intriguing facts. Now the humble typewriter is relegated to third place; computers and word processors have emerged into this technological era, with as great an impact as the first wireless. It would be a fair assumption that Charles Babbage (the inventor of the first mechanical computer 1835) could not have foreseen the immense advantages his creation has brought to people in the latter part of the twentieth century.

This dissertation began in the early sixties and followed the progress of typewriters and computers into the next two decades, and glimpsed briefly into the nineties. We can never be quite sure of what the future will bring, but one thing is certain, regardless of the changes designers and manufacturers will bring, the computer has made an impact on all of us and is here to stay.

"I fear none of the existing machines, what I fear is the extraordinary rapidity with which they are becoming something very different to what they are at present ... should not that movement be jealously watched, and checked while we can still check it".

- Samuel Butler

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