



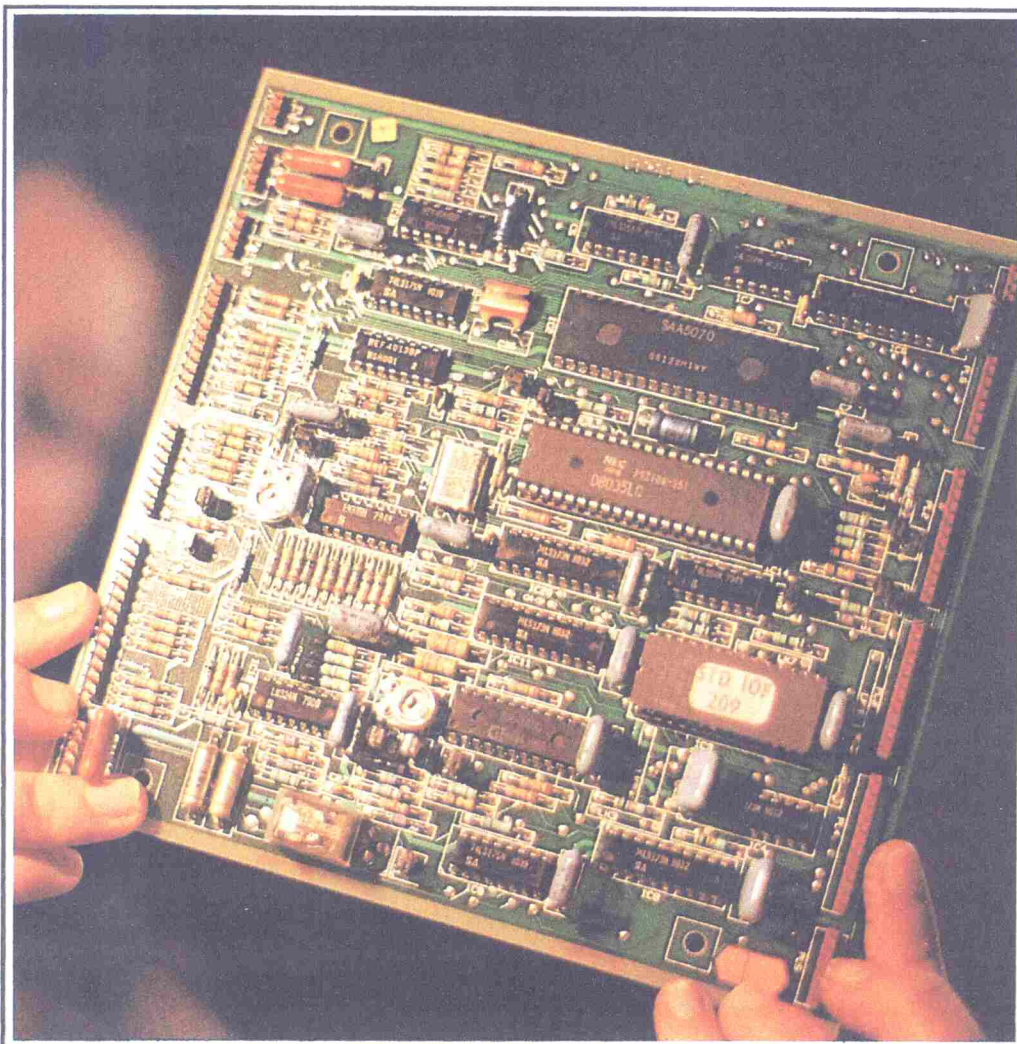
Technology

VIDEOTEX*

NEW GENERATION TERMINALS

Videotex workstations in the form of Rediffusion's new System Alpha 'Teleputer' systems are now entering the third generation after five years of continuous development. These past five years have seen videotex technology expanded exponentially and it is now ready to become an 'overnight success'. The technology is almost entirely UK-based.

*In this paper the terms videotex and viewdata are interchangeable.



The first and second generations of videotex workstations were modified domestic television sets. The original perception of videotex was as a domestic residential consumer telecommunication medium utilising public service-provided information databases distributed to homes via telephone lines. With this scenario, the home terminal needed to be a low cost device, easy-to-use and as near familiar as any popular consumer electronic product. The chosen host for the new technology was the domestic television. The reasoning was that videotex capability could be added at low incremental cost to domestic television through the use of mass-produced dedicated chips and that, with an attractive human interface, it would be easy to operate and overall it would look just like a domestic television.

The technological achievements in designing



Casualties in the industry can be expected.

The narrowband view of the participants — service operator, IPs, terminal suppliers and so on — means that there is no broad-band of realisation of the potential of the technology. There is only one vertically integrated supplier producing computers, software, terminals and services. That supplier, Rediffusion, has sold more private videotex systems than anyone else and, it may be merely coincidental, most of those systems were non-dedicated videotex systems. In fact, they were integrated electronic office systems.

There can be little doubt that the pursuit of business videotex will create fast

technological change as computers, software and terminals are tuned to meet business needs. For public service videotex, because of the vast scale at which it operates, change will come more slowly. The gap between private and public systems will grow ever wider, but, in turn, the spreading of the technology will create new opportunities. As long as both types of system use common interfaces nothing will be lost.

The second generation Viewdata 80 terminals were the catalysts for the changes in the videotex industry. The third generation terminals will be instrumental in shaping the industry for the future.

Viewdata 80 terminals provided a broad spectrum

of working experience with videotex. Third generation products have been built on that experience. There are four aspects of terminal products that are relevant. These are fitness for purpose, ergonomics, versatility and operating economics. Each will be considered in turn.

Fitness for purpose encompassed technical specification, features and functions, health and safety considerations and operating characteristics. The starting point for the technical specification of third generation terminals is the LUCY⁽²⁾ chip set produced by Mullard.

LUCY is the follow-on dedicated videotex chip set after Viewdata 80. LUCY provides Prestel-compatible alpha-mosaic

videotex but, doubtless, it will be upgraded to the new European CEPT standard and, thereafter, the AT & T standard.

In the basic chip set, there is additional intelligence, faster transport speeds (1200bps/1200bps), local page store in semi-conductor memory and the ability to add new features such as automatic answering, relatively easily.

The new feature options are important in being able to tailor videotex terminals for specific uses which may become diverse as the technology spreads.

Health and safety considerations have led to technical changes, the most apparent of which is software control of screen interlacing. Interlacing is automatically switched on for video pictures and switched off for videotex, thus providing the best vision presentation for both mediums and removing the wavy line characters once prevalent on videotex. Improved high resolution colour TV tubes also improve presentation further.

Ergonomics have influenced screens, housings and keyboards, each of which is a subject in its own right. Desk-top screens will probably standardise around 14in. and 'stand-alones' will be 20in. or 22in.

Cosmetics are important because the videotex terminal has to be attractive and needs to look like a co-ordinated system. Housings vary according to purpose. More electronics are being put into the keyboard housing rather than having a separate plinth, particularly for the basic terminal models. For the more elaborate models, plinths have been retained.

Keyboards have been a vexed subject to date with

for this scenario have been outstanding. Public service Prestel⁽¹⁾ was implemented with trivial teething problems and now represents the largest on-line network using dedicated terminals in the world. Domestic televisions were modified in two stages equivalent to the first and second generation. The first generation was limited numbers of televisions for the Prestel trial service. These were built between 1977 and 1979, and, using a mixture of dedicated and general purpose logic, they were able to dialogue with Prestel computers. The lessons learned from these terminals led to the design of the first volume-produced terminal products, based on a UK specification called Viewdata 80 (often referred to as VAC '79 in the industry).

Viewdata 80 was the second generation standard for videotex terminals. A dedicated viewdata module was produced by the chip makers for assembly into the television electronics. The module provided line handling, data communications transport mechanism with 1200bps between computer and television and 75bps upstream from television to computer, an integral chip modem with automatic telephone number dialling and a locally programmable telephone directory holding six telephone numbers, including two automatic alternates for 'engaged' numbers. In addition, Viewdata 80 provided standard interfaces for peripheral device connection to the terminal. These interfaces included cable-connect, full alphanumeric keyboards of various configurations (first generation terminals used mainly handheld infra-red numeric only keypads),

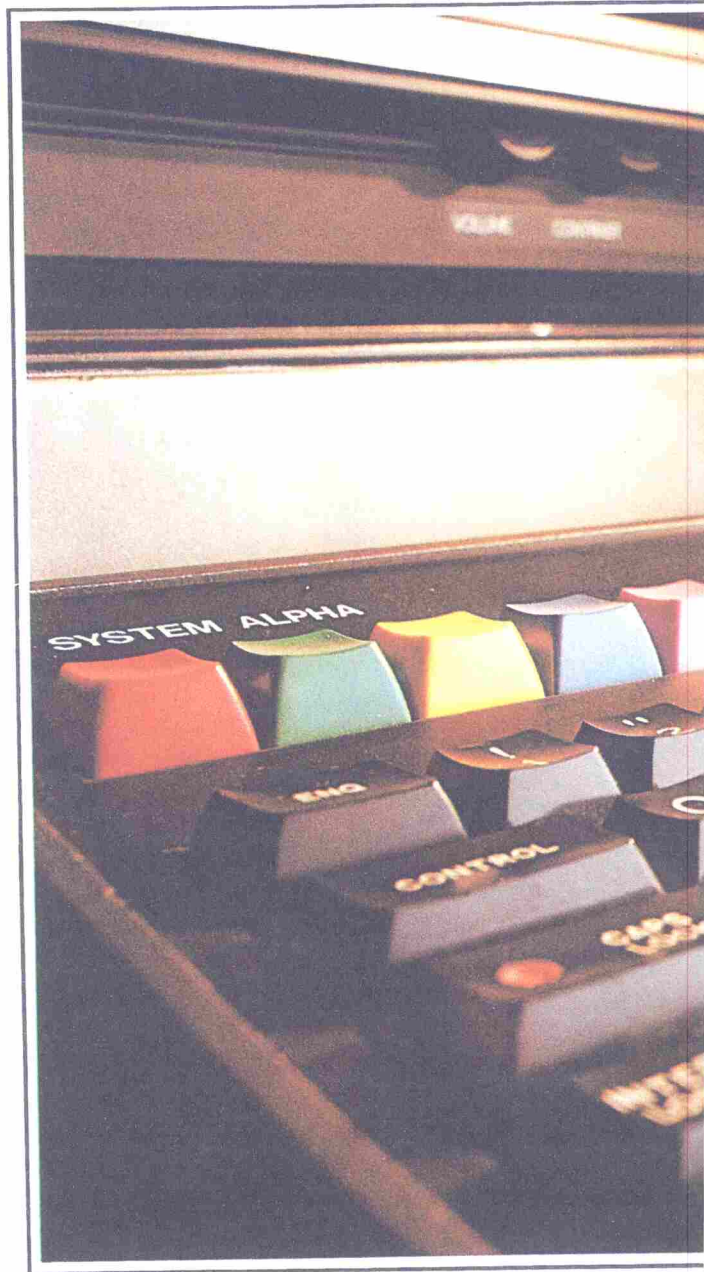
printers, and audio-cassettes for page store. Some 10,000 to 15,000 terminals based on Viewdata 80 were manufactured and they provide the bulk of the terminals connected to Prestel at this time.

The terminals are a mixture of small screen (less than 20in.) desk-tops and stand-alones and large screen (more than 20in.) stand-alones. The vast majority use colour tubes. The desk-top and stand-alone dichotomy came to the fore with Viewdata 80 (1980-1981) when it became apparent that there was a business market for videotex.

During the life of Viewdata 80 a consensus gradually formed that the real market for videotex for the next few years (until the mid-'80s) would be business users and not domestic users.

This consensus view marked a watershed in the history of the videotex industry in the UK. The industry had been created through the invention of an attractive technological product by the British Post Office which persuaded a UK computer manufacturer to modify a computer and support it, cajoled the UK TV manufacturers to produce suitable terminals and enticed the UK communications industry to establish an information provision industry. However, all of this had been built upon massive market penetration projections that had proved to be wildly inaccurate.

With the prop gone, the edifice started to crumble. Information providers who had been seeking a mass domestic market curtailed their activities. TV manufacturers turned to the more lucrative small, colour, portable, standard sets for which demand was growing. TV rental



companies focussed on the VCR market that seemed to boom. Prestel turned towards the business market. Makers of TV adaptors for Prestel connection alone continued with the domestic residential market.

On other fronts there were also major changes. The agreement of the European PTTs on a European alpha-mosaic standard in early 1981 was followed by the AT & T declaration of alpha-geometric standard. The world was moving fast towards technical standards which were always pre-requisites for the development of a world market.

During the second generation, many PTTs

decided to set up experimental and/or full public service videotex systems often using the Prestel standard. Perhaps most significantly, many of the leading computer companies announced videotex connectivity for their computers. The scene has now been set for the explosive world growth of videotex.

In some ways, although the UK pioneered videotex it is not well-positioned to exploit its potential. The reasons are not hard to understand. The UK videotex industry is highly fragmented and constructed largely to support public service Prestel. Because of this fragmentation it is virtually impossible to get any cohesive marketing.

videotex terminals. Traditional keyboards (typewriter or computer terminal style) have been found to be unsatisfactory for a variety of reasons, viz layout, touch, angle of keys, size and so on. Experience indicates a requirement for four types of keyboard depending on applicational usage. These are:

1. Infra-red numeric handpads for casual numeric use.
2. Calculator-style, cable-connect alphanumeric keyboards (QWERTY or ABC) for casual alphanumeric use.
3. Professional alphanumeric cable-connect keyboards for heavy duty alphanumeric use.
4. Professional 'information provider' keyboards and cable-connect for page layout.

Obviously the keyboards must be interchangeable with different screens and different electronic configurations in a way that is transparent to the user.

Versatility is an important issue. To date, the terminal has tended to be constrained by Viewdata 80 chips. With private systems, the versatility, therefore, has been provided by special computer hardware and software.

With the new generation, however, versatility comes to the terminal supported by further computer hardware/software improvements. The basis of this versatility is a modular approach to providing a range of configurable models and a mix-and-match feature/function capability. For the first time with Rediffusion's System Alpha 'Teleputer' terminal, videotex is being converged with other technologies to create new types of electronic media.



Photographs taken by Mike McCormac, product marketing department.

The entry level new generation videotex terminal provides LUCY chip functions together with a choice of keyboards and printers, optional incremental local page store and optional 1200/75bps or 1200/1200bps working.

The second level terminal provides improved intelligence for off-line local editing with some local computing power. The third level offers full-function videotex together with full-function local computing and an array of peripheral options, including magnetic disk. It also makes use of industry standard operating software, compilers, utilities and application software. These products also have automatic answering and use both videotex and teletext networks.

Level three new generation 'Teleputer' videotex terminal is an example of converged technology: television, videotex, teletext, personal computing, word processing and network communications. But there is more.

The mix-and-match adds logic control of video cassette recorders,

interworking with videotex, downstream logic control video disk and connection of the terminals into the Packet Switched Service without using public service gateways.

The videotex terminal thus becomes the ubiquitous virtual terminal. With powerful local intelligence, ability to network into most other networks and attractive economics, it sets new standards for business terminal systems and will, without much doubt, transform market acceptance of videotex technology.

Economics are important. Private videotex systems are generally cost-justified against a tangible project and a targeted pay-off. The ubiquitous videotex terminal with low cost, long-distance data communications capability will not only bring extensive videotex facilities into offices, but it may also displace other, older devices that are not network independent. The new videotex terminal will cost not much more than second generation videotex terminals and may well be less expensive than products it displaces.

The ability of third generation systems in using the PSS network for long haul (over 56Km) links reduces transport costs by a minimum 70% compared with PSTN.

Multi-media terminals are new and they will have a profound impact on communication and particularly on displacement of older publishing methods. Downstream, the usage of converged multi-media terminals in business may well spill over into consumer telecommunications.

The new generation 'Teleputer' terminals are not expected to have much impact on residential videotex. Home disposable income for consumer electronics is currently being channelled into VCR and soon into low cost personal computers and this is unlikely to change before the mid-'80s. In the meantime, business videotex will be the prime mover for technological innovation and development. With the new generation of terminals much of that will move to the equipment nearest the user.

(1) Prestel is a trademark of British Telecom.
 (2) LUCY is a trademark of Mullard Limited.