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Dear Mr Hauser

CET TELESOFTWARE PROJECT

Thank you for your letter of 25th January expressing your interest in the CET Telesoftware Project. We have already, of course, had a number of discussions about Telesoftware standards with both Acorn and the BBC.

Five schools with BBC machines will be included as sponsored institutions in our Telesoftware trial and we intend to distribute programs for the BBC machine through Prestel. We will also be buying a BBC machine for the Telesoftware Project as soon as the Prestel adaptor is available.

I enclose a copy of the CET Telesoftware information sheet. You may also be interested in the CET Telesoftware pages on Prestel 2114.

Yours sincerely

pp Alison M. Herbert.
Chris Knowles
Telesoftware Project Manager

Enc.

CET INFORMATION SHEET No.3

TELESOFTWARE

1. Introduction

For education and training, the importance of the development of telesoftware is that it offers the basis for an electronic national system for the distribution of computer programs. Since the potential of the microcomputer as a teaching and learning resource is limited by the extent to which teachers and students can get hold of good educational materials to use with the hardware, such a system could make a powerful contribution to more rapid developments in this area.

2. Definition

"Telesoftware" is one of a number of vaguely defined terms which have been developed as part of the growth of information technology. It was first coined in 1977 to describe the broadcasting of computer programs over television channels to intelligent teletext terminals.

Now it is used more widely to describe the transmission of programs from one computer to another either by broadcast radio or television or via telephone lines.

In simple terms, what actually happens is that the first computer, usually a micro, automatically retrieves a program stored in a second computer, usually a mainframe. It checks that the data has been transmitted correctly, then stores the program on cassette or disk, for use when required.

3. The Systems

Broadcast telesoftware uses the BBC's Ceefax and IBA's Oracle teletext services.

Telephone based telesoftware can be based on any viewdata system or even on locally established telephone links between mainframe and microcomputers, but, in present developments in the UK, British Telecoms PRESTEL service provides the basis for national telesoftware experiments.

Both systems exploit the capacity of a microcomputer to receive and store data transmitted by broadcast signals and by telephone line.

4. The Hardware

To access CET's Prestel telesoftware, the potential user needs, at present:-

1. a microcomputer (specifically an RML 380Z disk-based machine although facilities will soon be available for other machines).

2. a means of connecting a microcomputer to a telephone line, currently a modem, which can be rented from British Telecom, and a safety cable.

3. a Prestel jack socket also obtainable from British Telecom.

Prestel adaptors that can be connected to microcomputer systems are also becoming available, which allow Prestel frames to be stored and retrieved on disk but these are relatively expensive and do not offer all the facilities provided by the applications software described below.

For the Brighton project's teletext telesoftware the potential user needs a specially developed intelligent TV terminal which allows interfacing between the broadcast signal and a microcomputer. A limited number of terminals have been contructed by Mullard and have been developed by them to meet specifications agreed jointly by the Teletext broadcasters and the Computer Centre at Brighton Polytechnic. The terminals are being evaluated by the Polytechnic as part of the Telesoftware and Education Project. (See section 6.2)

For the BBC's proposed service (see 6.4) it is hoped that a single box will contain both teletext and Prestel decoders and the necessary modem for connection to the telephone.

5. The Software

For Prestel telesoftware, a software package will be commercially available from Research Machines Ltd for their 380Z machine. This can provide

Prestel reception

frame printouts

retrieval to disk of Prestel frames (provided appropriate copyright clearance is obtained)

retrieval to disk of computer programs

a viewdata editor and user program, enabling the user to create, maintain and search a local viewdata-base into which Prestel frames may be absorbed.

In due course, software packages will be made available for other popular types of microcomputers.

For Brighton's teletext telesoftware, the operating software is built into the special equipment needed to receive the service, and for the BBC's a special chip will be built into the microcomputer.

6. Development Projects

CET is concerned with development projects for both viewdata and teletext telesoftware transmission, with a view to establishing what each system has to offer to education and training.

6.1 CET Telesoftware Project

With financial support from the Department of Industry, CET has just set up a two-year trial scheme for the distribution and reception of computer programs via Prestel. Up to 25 institutions throughout the UK will be supported in the trial with a library which will grow during the trial to a limit of about 50 well tried and tested programs. Other institutions will be able to use the service at their own expense and are invited to contact the Telesoftware Project Manager at Burleigh Teachers Centre, Wellfield Road, Hatfield AL10 0BZ after 1 September 1981 if they would like to be involved in the project.

Work which will be done during the project will include:-

discussing with other microcomputer manufacturers the provision of a telesoftware facility for their machines

promoting the development of an integral modem for microcomputers to enable them to receive telesoftware

organising a system for the delivery of documentation and learning materials associated with the computer programs

providing in-service training in the use of the system within institutions

investigating alternative pricing structures

investigating the potential of the new PRESTEL "gateway" facility, which allows access to other computers through the PRESTEL system.

Progress reports on the project will appear regularly in CET and CAL News and interim up-dated information can be obtained through Jill Coates at CET.

The strengths of the Prestel telesoftware system developed by CET at its Prestel Unit at Hatfield, are these:-

(1 After dial up, it is fully automatic. Call the appropriate Prestel page number for a description of the program. If you decide you want it, press the buttons and the program is retrieved, delivered and stored without any further intervention from the user.

(2) It is fast. A 5K program can be brought down on to disk in about 2½ minutes.

(3) The Prestel system is already available at local call rates in over 60% of the UK.

(4) The telesoftware system can be used to distribute programs in all the languages most commonly used in education.

(5) Different versions of programs can all be made available on Prestel and the user routed to the one designed for his or her machine.

(6) It has an automatic error checking facility so that line noise cannot result in corrupted programs being stored unknowingly and there is little or no possibility of the corruption that can occur when programs are sent through the mail.

(7) The ease of updating on Prestel means that users will always have access to the latest version of a program.

(8) Documentation and essential learning materials associated with programs can be ordered on the system by use of a response frame.

(9) An automatic charging mechanism can be built into the Prestel telesoftware service. This may result in cheaper programs for the user, since program providers' administrative costs are likely to be lower.

6.2 Telesoftware and Education Projects

This project which is based at Brighton Polytechnic, under the direction of Michael Raggett, is investigating the educational potential of teletext software, using the broadcast facilities of CEEFAX and ORACLE.

Financial support for the project is being provided by the television authorities, the Department of Industry, through the National Computing Centre, the Department of Education and Science and the Scottish Education Department CET and SCET and the Schools Council.

A network of nine schools has been set up to take part in the project. Although each of the teachers initially concerned with the project is capable of programming the microcomputer, one of the aims of the project is to enable teachers to capture and run programs without having to become experts in programming techniques themselves. The teletext terminal installed in each of the nine schools can operate in four modes:

1. As a normal 22" colour television receiver

2. As a teletext receiver

3. As a stand-alone microcomputer using the television screen for display purposes

4. As a teletext terminal capable of receiving and storing broadcast computer programs

Broadcast computer programs are received through a specially compiled master program. A built-in cassette recorder allows both broadcast programs and those typed in through the keyboard to be retained.

Special facilities have been developed to enable volatile information carried within teletext pages, such as the F.T. Share Index, weather statistics etc., to be accessed while programs are being run.

The project will arrange for CEEFAX (BBC 1 only) and ORACLE to carry different examples from the range of computer programs currently available from bodies such as the Schools Council and will encourage teachers to provide examples of their own programs.

The advantages of broadcast telesoftware systems are similar in the main to those detailed above for Prestel telesoftware except for one important difference - whereas the Prestel system requires the user to pay rental and connection charges (see section 7), the broadcast telesoftware system operates entirely free of charge, once all the necessary equipment has been acquired.

It is hoped that a report on the experimental work will be available in 1983.

6.3 Scottish work on Telesoftware

SCET and the Scottish Microelectronics Development Programme (SMDP) are co-operating with CET to provide advice and support to Scottish schools involved in the telesoftware projects described in 6.1 and 6.2.

In addition SCET and SMDP are adapting the software supplied by CET for the RML 380Z to allow the CROMEMCO microcomputers used in Scottish Schools to act as a viewdata terminal and to perform telesoftware functions. At a later stage the adaptation of software for other microcomputers may be investigated.

SCET has recently (June 1981) taken delivery of a computer which updates its existing Prestel off-line editing terminal to a private viewdata system with sufficient data storage capacity and simultaneous user ports to offer a realistic service to schools and colleges.

SCET will be investigating the costs and feasibility of using this private viewdata system (rather than Prestel) as a means of storing and transmitting programs held in telesoftware format for users in education.

6.4 BBC Computer Literary Project

The forthcoming BBC Computer Literary Project, to be launched in January 1982, and the associated BBC Microcomputer, provide both the occasion and the instrument for the Corporation to proceed with telesoftware on an experimental basis and to lay the foundation for a possible new service. A low cost teletext decoder (with a Prestel option) will be available from January 1982 as an optional peripheral for the BBC's Microcomputer system.

Test transmission will begin in July/August 1981 to enable suitable hardware and software to be developed for the reception and downloading of telesoftware programs into a suitable microcomputer system and linked teletext decoder. Simultaneously it is hoped to make one of the BBC DATA pages on Prestel available for similar telesoftware experiments using the telephone. Ultimately the hope is that a mixed economy for telesoftware programs will be established involving both teletext and Prestel.

The telesoftware operating procedures used have been based on the procedures recommended for Prestel by CET, and take into account the procedures used in the Brighton telesoftware experiment.

The proposed procedures take advantage of new facilities which have been defined for enhanced teletext transmission. In particular, each page can be tested to ensure that it is completely and correctly in the decoder store before it is acted upon. Also, each page can include the full address of other linked pages which can then be automatically accessed without further action from the user.

Initially, at least, program listings will be accessible to the viewer so that owners of teletext sets who do not possess hardware for downloading telesoftware will be able to enter the listings directly into their microcomputer by hand.

The Corporation is also exploring the possible use of EDUTEXT - or another language developed by the National Physical Laboratory - for the production of data which can be transmitted in machine independent form via viewdata.

7. Costs

Costs will be, of course, a crucial factor in determining whether telesoftware will be successful in its challenge to traditional distribution methods. The costs incurred in using the two types of systems take different forms.

To receive teletext telesoftware, it will be necessary to buy specially designed equipment (see sections 6.2 and 6.4) but the distribution service itself is free. It is not yet clear how program providers will charge for their programs where a normal selling price is involved.

To receive Prestel telesoftware now, an educational institution with an appropriate microcomputer would incur the following costs:-

Installation charges	
Prestel 95A Jack Socket	£13.00
British Telecom Datel 600 modem	£60.00[1]
Purchase of software package	£39.50[2]
Purchase of modem barrier cable	£40.00[3]

1 Only necessary till integral modem is available (see section 6.1)
2 Cost to educational institutions - a higher charge is made to commercial organisations

Rental Charges (per quarter)

Prestel 95A Jack Socket	15p
British Telecom Datel 600 modem	£40.00
Prestel Business Users' Charge	£12.00

Running costs of Prestel contain three elements:-

(a) telephone local call charges (Prestel is available to over 60% of the UK at local call rates)

Peak rate	4p for 2 minutes
Standard rate	4p for 3 minutes
Cheap rate	4p for 5 minutes

(b) Prestel system charges

Peak/Standard rate	4p for 1 minute
Cheap rate	4p for 4 minutes

(c) Prestel frame charges, which would only apply for telesoftware if the program providers decided to use this method of collecting the normal charge made for the purchase of a program.

At these rates, the distribution cost for the 5K program mentioned in Section 6.1. would be 15p at peak time, 14p at standard time and only 8p at cheap rate time. This compares with 38p (first class) or 30p (2nd class) for sending a program on disk through the post. Since the costs of the labour intensive postal service are likely to continue to rise, it seems probable that telesoftware may become a cheaper as well as a quicker and more efficient delivery system for computer programs.

8- Format Recommendations for Prestel Telesoftware

It is likely that, in the course of time, a number of Information Providers on Prestel may wish to use the system for the distribution of computer programs. For obvious reasons, it is highly desirable that a standard format for viewdata telesoftware should be adopted, and in September 1980, CET invited computer manufacturers, software agencies, users and representatives of Prestel to discuss the formulation of a set of format recommendations for telesoftware on Prestel. Copies of the document which was agreed as a result of these discussions can be obtained from CET on request, and it seems likely that these recommendations will become generally accepted. They will provide a basis for development while a longer term international standard is established.

9. Conclusion

The work of the Microelectronics Education Programme and the Scottish Microelectronics Development Programme over the next few years should lead to a steady growth in the production of computer programs suitable for use in schools. It is CET's hope that, by the time these Programmes end,. the potential of telesoftware as a distribution mechanism for computer programs will have been thoroughly explored and that the first steps will have been taken to set up on a permanent basis whatever services are then seen to be of the greatest benefit to program users.