Some experiments in man-machine interaction relevant to computer assisted learning
Yeates, H.

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SOME EXPERIMENTS IN MAN-MACHINE INTERACTION
RELEVANT TO COMPUTER ASSISTED LEARNING

A Thesis submitted for the degree of
Master of Science
in the University of Durham

VOLUME II

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An overview of the various courseware items used to construct the multi-media CAL system was given in Chapter 6 (Volume 1) of this thesis. This volume (Volume II) contains the technical details and descriptions of those resources and is sub-divided into six sections whose contents are as follows:

Section 1 presents a listing of the BASIC program statements used to control the Commodore PET microcomputer and its peripherals.

Section 2 contains the coursebook "GUIDEBOOK TO TELETEXT SYSTEMS" which describes the general and learning objectives and provides remedial textual and graphical information to supplement the 35mm slides and audiotape used in the teaching programme.

Section 3 illustrates the script which was used to develop the audiotape. This was synchronised with the set of 35mm slides (see Section 5) for use on the SINGER 'CARAMATE' slide projector interfaced with the microcomputer.

Section 4 describes the questions and multiple-choice answers which were presented to the users of the teaching programme. These were displayed on the screen of the Commodore PET microcomputer.

Section 5 contains copies of the 35mm slides produced for the experiments with the SINGER 'CARAMATE' slide projector.

Section 6 describes the 35mm slides and the pre/post test questions which were developed for use with the KODAK random access slide projector. References to the sources of information for production of the material on "TELETEXT SYSTEMS" is also included in this section.
SECTION 1
THE COMPUTER SOFTWARE
INTRODUCTION

The program responsible for running the CAL experiment was written in the BASIC programming language. The version used was determined by the nature of the microcomputer used (Commodore PET). BASIC was the only high level language available with the system. An example of typical BASIC code used to produce a frame of information on the microcomputer screen was presented as Figure 6.15 in Chapter 6, Volume 1.

The load size of the program was over 30,000 bytes, which represented 93% of the capacity of the computer. During initial experiments only a tape cassette was available for storing the program. When a dual disk drive unit became available, the program was subsequently transferred to a flexible disk. As a result the program loading time was reduced from 11 minutes to under 5 seconds.

The program contained over one thousand statements. A high proportion of these (about 60%) were PRINT statements that caused information to be displayed on the screen of the microcomputer. In order to plan the arrangement of items on the screen special Frame Layout Charts were used. An example of a Frame Layout Chart was given in Figure 6.11, Chapter 6, in Volume I. A complete analysis of the program by statement type, together with notes covering running and development time, was presented in Section 6.51 of Chapter 6, Volume 1.

If the system was to be redesigned, taking into account the availability of a random access storage facility, then a much better solution to the software problem could have been formulated in terms of a random access file. The logical structure of this file was described in Section 6.52 (Future Design Recommendations) in Chapter 6 of Volume I.

A listing of the BASIC statements used in the program for the experiments is presented in the following pages. In this listing it has not been possible to reproduce the special graphic characters that are provided by the PET. Some of these represent control characters used to manipulate the position of the cursor on the microcomputer screen.
Because of their importance in controlling the layout of information on
the screen a special notation has been used to represent these.

A cursor control sequence is introduced and terminated by an oblique
stroke (/). The same set of delimiters is used to introduce a sequence of
graphic symbols. Within these oblique strokes a mnemonic code or
three-digit number is used to denote these print characters which the
printer is unable to produce. The graphics associated with the numeric
values used are defined in the Commodore PET Users' Manual.

The most frequently used mnemonic and their meanings are:

C        - clear screen
H        - home the cursor
Dn       - move the cursor down n lines
Rn       - move the cursor right n positions
RV       - turn reverse video on
RO       - turn reverse video off
Gddd.... - display a sequence of graphic characters

The use of these characters is illustrated in statement 140 in which the
cursor control sequence

/CD5RS/

means "clear the screen and move the cursor down 5 lines and to the
right 5 places" before printing any text. The use of graphic codes
(/G223162....../) is illustrated in program lines 9100 through 9190 of the
listing.
100  DIM  PA(7),M(20),AP$(20),TA(20),KI(20),HR(20),PG$(20)
110  GOSUB  7960 : REM  INITIALISATION  DATA
120  GOSUB  9010
130  TS=TI :  K=8
140  PRINT"/CDSRS/COURSE:  TELETEXT  SYSTEMS"  
150  PRINT"/R5/***************"  
160  PRINT"/D3R6/ENTER  YOUR  NAME:"  
170  PRINT"/DIR6/ENTER  COURSE  CODE:"  
180  PRINT"/DIR3/PLUG  ME  IN..."  
190  PRINT"/DIR3/SWITCH  ON  TAPE  SLIDE  EQUIPMENT...."  
200  PRINT"/DIR3/TYRE  'GO'  WHEN  YOU'RE  READY  TO  START"  
210  PRINT"/DIR3/CONTACT  YOUR  TUTOR  (PHILIP  G.  BARKER)"  
220  PRINT"/K3/ .....  IF  YOU  HAVE  ANY  PROBLEMS"  
230  PRINT"/HDR8/25/"  
240  INPUT"/R6/ENTER  YOUR  NAME:";A$  
250  INPUT"/D1R6/ENTER  COURSE  CODE:";B$  
260  NAME$=A$  
270  INPUT"/D12/>";G$  
280  PRINT"/CD3/THIS  TAPE  SLIDE  DEALS  WITH:"  
290  PRINT"/DIR20/TELETEXT  SYSTEMS"  
300  PRINT"/R20/***************"  
310  PRINT"/R3/THREE  TYPES  OF  SYSTEM  WILL  BE  DESCRIBED"  
320  PRINT"/DIR4/(A)  CEEFAX  &  ORACLE"  
330  PRINT"/DIR4/(B)  VIEWDATA"  
340  PRINT"/DIR4/(C)  PLATO  &  CYCLOPS"  
350  PRINT"/D2/FIRST  WE'LL  LOOK  AT  THE  MEANING  OF  THE  TERM  COMMUNICATION"  
360  PRINT"/D3/TYP£  'GO'  WHEN  YOU'RE  READY  TO  PROCEED"  
370  INPUT"/D2R2/>";GO$  
380  PRINT"/CD3/NAME:  +A$  
390  PRINT"/CD3/COURSE  CODE:  +B$  
400  PRINT"/D3R3/PRESS  ADVANCE  ON  THE  CARAMATE"  
410  PRINT"/D3R3/PRESS  PLAY  ON  THE  CARAMATE"  
420  PRINT"/D3R3/WATCH  THE  SLIDES  ..."  
430  PRINT"/D3R3/LISTEN  TO  THE  TAPE  RECORDING  ....."  
440  PRINT"/D3/"  
450  PRINT"YOU'LL  BE  ASKED  QUESTIONS  ABOUT  WHAT  YOU  SEE  AND  HEAR..."  
460  NF=65 : REM  NUMBER  OF  SLIDES  TO  SHOW  
470  NS=0 : REM  COUNT  OF  SLIDES  CHANGED  
480  POKE  59459,255  
490  POKE  59471,5  
500  IF  PEEK(59471)=5  THEN  500  
510  LIM=TI+30  
520  IF  TI<LIM  THEN  520  
530  NS=NS+1  
540  REM  PRINT  "SLIDE",NS  
550  FOR  I=1  TO  7 : IF  NS=PA(I)  THEN  580  
560  NEXT  I  
570  GOTO  490  
580  POKE  59471,0  
590  GOSUB  7440 : REM  EXPLAIN  NEXT  STEP  
600  ON  I  GOSUB  649,1019,2338,3318,3799,4140,5390  
610  IF  NS=NF  THEN  GOSUB  8050 : GOTO  120  
620  GOSUB  7500  
630  GOTO  490  
640  REM  QUESTION  SET  :)  11111111111111  
650  GOSUB  7570  
660  PRINT"/CHD2/"  
670  PRINT"/CHD3/WHAT  IS  THE  MAJOR  DISADVANTAGE  OF"  
680  PRINT"SOME  OF  THE  CONVENTIONAL  METHODS  OF"  
690  PRINT"COMMUNICATION  SUCH  AS  BOOKS,MANUALS  AND  NEWSPAPERS?"
PRINT "/R2/CHOOSE ONE OF THE FOLLOWING:" 
PRINT "/D1/(A) REVISION AND DISTRIBUTION IS COSTLY" 
PRINT "/D1/(B) THE CONTENT AND QUALITY VARIES" 
PRINT "/D1/(C) NO INTERACTION IS POSSIBLE" 
PRINT "/D1/(D) WE HAVE NO GUARANTEE OF UNDERSTANDING" 
PRINT "/D1/TYPE THE LETTER THAT CORRESPONDS TO YOUR ANSWER" 
INPUT ">>"; A$ 
PRINT "/D3/" 
IF A$="C" THEN 830 
IF A$="A" OR A$="B" OR A$="D" THEN 870 
PRINT "/D1/INVALID ANSWER"; KI(K)=KI(K)+1 
PRINT "/D3/" 
GOSUB 6960: GOTO 670 
PRINT "/D1/YOU ARE INCORRECT!!"; F2=0 
PRINT "/D2/THE CORRECT ANSWER WAS C" 
PRINT "/D2/LET'S CHECK THROUGH IT" 
GOSUB 7630 
GOSUB 7120 
RETURN 
REM QUESTION SET2 
GOSUB 7570 
PRINT "/D2/WHAT ARE THE NAMES OF THE TELETEXT" 
PRINT "/D2/SYSTEMS WHICH ARE BROADCAST BY THE" 
PRINT "/D2/BRITISH BROADCASTING CORPORATION (BBC)" 
PRINT "/D2/AND THE INDEPENDENT BROADCASTING" 
PRINT "/D2/AUTHORITY (IBA) RESPECTIVELY?" 
PRINT "/D2/THE CORRECT ANSWER IS DA" 
GOSUB 6960: GOTO 1360 
PRINT "/D2/YOU ARE ALMOST RIGHT"; F2=1 
PRINT "/D2/THE ANSWER IS DA NOT AD" 
GOSUB 6960: GOTO 1360 
REM
1300 PRINT "/CHD3R3/INVALID LETTERS" : K1(K)=KI(K)+1
1310 PRINT "/D3R3/ONLY A, B, C, AND D ARE ALLOWED" 
1320 PRINT "/D3R3/HAVE ANOTHER TRY"
1330 GOTO 1030
1340 GOSUB 6960 : REM WAIT 5 SECS
1350 PRINT "/CHD3R3/YOU ARE CORRECT" : F2=1
1360 GOSUB 6960 : REM WAIT 5 SECS
1370 PRINT "/D3R3/YOUR ANSWER IS TOO LONG"
1380 GOTO 1530
1390 PRINT "/CHD3R3/INVALID ANSWER"
1400 PRINT "/D6R3/TRY AGAIN"
1410 PRINT "/CHD3R3/INVALID LETTERS" : K1(K)=KI(K)+1
1500 GOSUB 6960 : GOTO 1030
1510 PRINT "/D6R3/YOUR ANSWER IS TOO LONG"
1520 GOTO 1480
1530 GOTO 1480
1540 REM SECOND QUESTION OF THE SET
1550 GOSUB 7570
1560 PRINT "/CHD8/LET'S TRY ANOTHER QUESTION"
1570 GOSUB 6960
1580 PRINT "/CHD2/DIFFERENT TYPES OF TELETEXT SYSTEM" 
1590 PRINT "ARE DISCUSSED IN THIS LESSON."
1600 PRINT "/D1/ HOW MANY BROAD TYPES ARE THERE?"
1610 PRINT "/D1R2/ SELECT ONE OF THE FOLLOWING:" 
1620 PRINT "/D1R5/A: TWO"
1630 PRINT "/D1R5/B: THREE"
1640 PRINT "/D1R5/C: FOUR"
1650 PRINT "/D1R5/D: FIVE"
1660 PRINT "/D3/TYP£ THE LETTER THAT CORRESPONDS TO YOUR ANSWER:"
1670 INPUT ">> " ; A$ 
1680 IF A$="B" THEN 1750
1690 IF A$="A" OR A$="C" OR A$="D" THEN 1770
1700 K1(K)=KI(K)+1
1710 PRINT "/CHD3/INVALID ANSWER"
1720 PRINT "/D3/YOUR ALLOWED CHOICES ARE:" 
1730 PRINT "/D1R3/A, B, C OR D"
1740 GOSUB 6960 : GOTO 1580
1750 PRINT "/CHD3R3/CORRECT" : F2=1
1760 GOTO 1780
1770 PRINT "/CHD3R2/NO, YOU'RE WRONG!": F2=0
1780 PRINT "/D2R2/THE ANSWER IS B"
1790 GOSUB 6960 : REM WAIT 5 SECS
1800 PRINT "/CHD2/LET'S REVISE THIS TOPIC"
1810 PRINT "/D2/HERE ARE THREE TYPES OF TELETEXT SYSTEM"
1820 PRINT "/U1/WHICH BETWEEN THEM PERMIT:" 
1830 PRINT "/D1R2/L. ONE-WAY COMMUNICATION USING"
1840 PRINT "/R5A TV CHANNEL, " 
1850 PRINT "/D1R2/2. TWO-WAY COMMUNICATION USING"
1860 PRINT "/R5A TELEPHONE NETWORK, " 
1870 PRINT "/D1R2/3. TWO-WAY COMMUNICATION USING"
1880 PRINT "/R5A COMBINATION OF A TV CHANNEL"
1899 PRINT "/R5/AND A TELEPHONE NETWORK."
1900 GOSUB 7120: GOSUB 7630
1910 PRINT "/CHD5/NOW ATTEMPT THE FOLLOWING QUESTION"
1920 GOSUB 6960: REM WAIT 5 SECS
1930 GOSUB 7570
1940 PRINT "/CHD3/HOW DOES THE USER SELECT THE PAGE"
1950 PRINT "OF INFORMATION THAT HE REQUIRES TO"
1960 PRINT "EXAMINE?"
1970 PRINT "/DI1R3/A: BY DIALLING A SPECIAL TELEPHONE"
1980 PRINT "/R6/NUMBER,"
1990 PRINT "/DI1R3/B: BY SELECTING A BBC OR ITV"
2000 PRINT "/R6/CHANNEL ON THE TV SET"
2010 PRINT "/R6/CHANNEL SELECTOR"
2020 PRINT "/DI1R3/C: BY USING A REMOTE CONTROL"
2030 PRINT "/DI1R3/D: BY MEANS OF A KEYPAD."
2040 PRINT "/DI1R1/TYPE THE LETTER THAT CORRESPONDS"
2050 PRINT "/R1/TO YOUR ANSWER:" INPUT "/DI1R7/>";AS
2060 IF AS="D" THEN 2150
2070 IF AS="A" OR AS="B" OR AS="C" THEN 2180
2080 IF AS="D" THEN 2150
2090 IF AS="D" THEN 2150
2100 PRINT "/CHD3/INVALID ANSWER"
2110 PRINT "/D3/PLEASE CHOOSE FROM THE FOLLOWING:" 2120 PRINT "/D2/ A,B,C OR D"
2130 PRINT "/D2/TRY THIS QUESTION AGAIN"
2140 GOSUB 6960: GOTO 1940
2150 PRINT "/CHD3R3/WELL DONE" ; F=1
2160 PRINT "/DI2R3/YOU ARE PERFECTLY CORRECT"
2170 GOTO 2200
2180 PRINT "/CHD3R3/SORRY - YOU'RE WRONG!" ; F=0
2190 PRINT "/D3R1/THE ANSWER, OF COURSE, IS D"
2200 GOSUB 6960: REM WAIT 5 SECONDS
2210 PRINT "/CHD2R1/THE KEYPAD IS USED TO CONTROL THE MODE"
2220 PRINT "/R1/OF OPERATION OF THE TV SET AND SELECT"
2230 PRINT "/R1/THE REQUIRED INFORMATION"
2240 PRINT "/DI2R1/TO DO THIS THE USER PRESSES THE"
2250 PRINT "/R1/APPROPRIATE NUMBERED KEYS ON THE"
2260 PRINT "/R1/HAND HELD KEYPAD."
2270 PRINT "/DI2R1/FOR EXAMPLE:" 2280 PRINT "/DI1R2R/ON THE TV SCREEN"
2290 PRINT "/DI1R2R/THE CODE 102 SELCTS 'HOME NEWS' /RO/"
2300 PRINT "/DI1R2R/THE CODE 106 GIVES 'FARM NEWS' /RO/"
2310 PRINT "/DI1R2R/THE CODE 115 PROVIDES A WEATHER MAP/RO/"
2320 PRINT "/DI3R3/HOW IS SPECIFIC INFORMATION"
2330 PRINT "/R3/ON DIFFERENT SUBJECTS IDENTIFIED"
2340 PRINT "/R3/IN A TELETEXT SYSTEM?"
2350 PRINT "/R5/A: USING DIFFERENT COLOURS"
2360 PRINT "/R5/B: USING CAPITAL OR LOWER"
2370 PRINT "/R8/ON THE TV SCREEN"
2380 PRINT "/R8/CASE (SMALL) LETTERS ON"
2390 PRINT "/R8/SHOW THE SCREEN"
2400 PRINT "/R8/WHAT THE LEAD" 2410 PRINT "/R8/CASE (SMALL) LETTERS ON"
2420 PRINT "/R8/SHOW THE SCREEN"
2430 PRINT "/R1R5/C: USING PAGE NUMBERS"
2440 PRINT "/R1R5/D: USING GRAPHIC SYMBOLS"
2450 GOSUB 7630
2460 IF AS="D" THEN 2530
2470 IF AS="A" OR AS="B" OR AS="C" THEN 2500
2480 PRINT "/CHD3/INVALID RESPONSE" ; KI(K)=KI(K)+1
8

3090 PRINT"/R8/THE BBC"
3100 PRINT"/DIR5/D: THE IBA ORACLE SYSTEM"
3110 PRINT"/R8/HAS MORE PAGES OF"
3120 PRINT"/R8/INFORMATION THAN CEEFAX"
3130 GOSUB 7060
3140 CS="D": W1$="A": W2$="B": W3$="C"
3150 GOSUB 7230
3160 IF F1=1 THEN 3080
3170 PRINT"/HC7R3/THE ORACLE SYSTEM HAS ABOUT"
3180 PRINT"/R3/800 PAGES COMPARED WITH THE"
3190 PRINT"/R3/CEEFAX SYSTEM WHICH HAS ONLY"
3200 PRINT"/R3/100"
3210 PRINT"/DIR3/THE IBA BROADCAST THE MORE"
3220 PRINT"/R3/IMPORTANT PAGES SUCH AS NEWS"
3230 PRINT"/R3/HEADLINES MORE FREQUENTLY THAN"
3240 PRINT"/R3/THE LESS IMPORTANT PAGES, SUCH"
3250 PRINT"/R3/AS HOROSCOPES"
3260 PRINT"/DIR3/THIS GIVES THE MORE IMPORTANT"
3270 PRINT"/R3/PAGES A FASTER RETRIEVAL TIME"
3280 PRINT"/R3/COMPARABLE TO THAT OF CEEFAX"
3290 GOSUB 7120:
3300 RETURN
3310 REM QUESTION 8 *******************
3320 GOSUB 7570
3330 PRINT"/HC7R6/TO DISPLAY INFORMATION ON"
3340 PRINT"/R6/A TELETEXT SCREEN REQUIRES"
3350 PRINT"/R6/THE TRANSMISSION OF PATTERNS"
3360 PRINT"/R6/OF BINARY ELECTRICAL PULSES"
3370 PRINT"/DIR6/HOW MANY BINARY DIGITS NEED"
3380 PRINT"/R6/TO BE TRANSMITTED TO FORM"
3390 PRINT"/R6/EACH CHARACTER ON THE SCREEN?"
3400 PRINT"/DIR9/A: 8"
3410 PRINT"/DIR11/B: 24"
3420 PRINT"/DIR11/C: 40"
3430 PRINT"/DIR11/D: 100"
3440 GOSUB 7060
3450 C$="A": W1$="B": W2$="C": W3$="D"
3460 GOSUB 7230
3470 IF F1=1 THEN 3330
3480 PRINT"/HC7R3/EACH CHARACTER REQUIRES 8"
3490 PRINT"/R3/BINARY DIGITS"
3500 PRINT"/DIR3/A ROW IS COMPOSED OF 40 "
3510 PRINT"/R3/CHARACTERS AND ONE PAGE OF"
3520 PRINT"/R3/INFORMATION CONTAINS 24 ROWS"
3530 PRINT"/DIR3/WHEN PAGES OF INFORMATION ARE"
3540 PRINT"/R3/BROADCAST THE ROW TRANSMISSION"
3550 PRINT"/R3/RATE IS 100 ROWS PER SECONF"
3560 GOSUB 7120 : GOSUB 7630
3570 REM QUESTION 9 *******************
3580 GOSUB 7570
3590 PRINT"/HC7R6/HOW WOULD YOU DESCRIBE THE"
3600 PRINT"/DIR9/APPEARANCE OF THE GRAPHIC"
3610 PRINT"/DIR6/CHARACTERS SEEN ON TELETEXT"
3620 PRINT"/DIR6/SCREENS?"
3630 PRINT"/DIR9/A: COLOURFUL"
3640 PRINT"/DIR9/B: UGLY"
3650 PRINT"/DIR9/C: SQUARE-EDGED"
3660 PRINT"/DIR9/D: ROUNDED"
3670 GOSUB 7060
3680 CS="C": W1$="A": W2$="B": W3$="D"
3698 GOSUB 7230
3700 IF F1=1 THEN 3590
3710 PRINT"/HCD7R4/TELETXT GRAPHIC CHARACTERS"  
3720 PRINT"/R4/ARE SQUARE-EDGED"
3730 PRINT"/D1R4/THIS PHENOMENON ARISES FROM"
3740 PRINT"/R4/THE FACT THAT GRAPHICS ARE"
3750 PRINT"/R4/BUILT UP FROM A COMBINATION"
3760 PRINT"/R4/OF SMALL COLOURED RECTANGLES"
3770 GOSUB 7120 ; GOSUB 7630
3780 RETURN
3790 REM QUESTION 10 *************
3800 GOSUB 7570
3810 PRINT"/HCD1R9/HOW IS THE INFORMATION"
3820 PRINT"/R9/TRANSMITTED TO TELETEXT"
3830 PRINT"/R9/SCREENS KEPT UP-TO-DATE?"
3840 PRINT"/D2R10/A: BY TRANSMITTING 'NEWS'",
3850 PRINT"/R13/ETC., FLICKERS ON THE"
3860 PRINT"/R13/SCREEN"
3870 PRINT"/D1R10/B: BY HAVING DIRECT LINES"
3880 PRINT"/R13/TO INFORMATION PROVIDERS"
3890 PRINT"/R13/E.G. REUTER'S"
3900 PRINT"/D1R10/C: BY MEANS OF EDITING"
3910 PRINT"/R13/TERMINALS CONNECTED"
3920 PRINT"/R13/TO A COMPUTER"
3930 PRINT"/D1R10/D: BY RECYCLING PAGES"
3940 PRINT"/R13/RAPIDLY"
3950 GOSUB 7060
3960 CS="C": W1$="A": W2$="B": W3$="D"
3970 GOSUB 7230
3980 IF F1=1 THEN 3810
3990 PRINT"/HCD7R3/THE INFORMATION PAGES ARE EDITED"
4000 PRINT"/R3/BY MEANS OF A TYPEWRITER KEYBOARD"
4010 PRINT"/R3/CONNECTED TO A COMPUTER"
4020 PRINT"/D2R10/A: BY TRANSMITTING 'NEWS'",
4030 PRINT"/R3/TYPES IN THE NEW INFORMATION AND"
4040 PRINT"/R3/THE PERSON PERFORMING THE EDITING"
4050 PRINT"/R3/PAGE WITHIN THE TELETEXT"
4060 PRINT"/R3/TO BE BROADCAST, THE NEW OR"
4070 PRINT"/R3/UPDATED INFORMATION GETS"
4080 PRINT"/R3/TO THE USERS OF THE"
4090 PRINT"/R3/SYSTEM"
4100 GOSUB 7120 ; GOSUB 7630
4110 RETURN
4120 REM QUESTION 11 *************
4130 GOSUB 7570
4140 PRINT"/HCD1R7/THE POST OFFICE ALSO"
4150 PRINT"/R7/OPERATES A TELETEXT SYSTEM"
4160 PRINT"/D1R7/WHAT IS ITS NAME?"
4170 PRINT"/R7/OPERATES A TELETEXT SYSTEM"
4180 PRINT"/D1R7/WHAT IS ITS NAME?"
4190 PRINT"/D2R11/A: EXTEL"
4200 PRINT"/D1R11/B: PRESTEL"
4210 PRINT"/D1R11/C: VIEWDATA"
4220 PRINT"/D1R11/D: DATTEL"
4230 GOSUB 7060
4240 CS="B": W1$="A": W2$="C": W3$="D"
4250 GOSUB 7230
4260 IF F1=1 THEN 4160
4270 PRINT"/HCD7R3/THE NAME OF THE POST OFFICE"
4280 PRINT"/R3/TELETEXT SYSTEM IS /RV/PRESTEL/RO/"
4290 PRINT"/D1R3/ORIGINALLY, THE POST OFFICE"
4300 PRINT"/R3/CALLED ITS SYSTEM VIEWDATA"
4310 PRINT"/R3/BUT AS THERE WERE SEVERAL"
4320 PRINT"/R3/OTHER VIEWDATA SYSTEMS OPERATING"
4330 PRINT"/R3/IN VARIOUS PARTS OF THE WORLD"
4340 PRINT"/R3/THE NAME WAS SUBSEQUENTLY"
4350 PRINT"/R3/CHANGED TO /RV/PRESTEL/RO/"
4360 GOSUB 7120 : GOSUB 7630
4370 REM QUESTION 12 **************
4380 GOSUB 7570
4390 PRINT"/HCD1R7/WHAT IS THE /RV/MAJOR/RO/ DIFFERENCE"
4400 PRINT"/R7/BETWEEN PRESTEL AND THE"
4410 PRINT"/R7/BROADCAST TELETEXT SYSTEMS"
4420 PRINT"/R7/CEEFAX AND ORACLE?"
4430 PRINT"/D2R9/A: IT'S FOR BUSINESS"
4440 PRINT"/R12.USERS ONLY"
4450 PRINT"/D1R9/B: USERS CAN COMMUNICATE"
4460 PRINT"/R12/WITH THE COMPUTER"
4470 PRINT"/D2R9/C: IT'S A MORE EXPENSIVE"
4480 PRINT"/R12/SYSTEM"
4490 PRINT"/D1R9/D: IT HAS MORE PAGES OF"
4500 PRINT"/R12/INFORMATION THAN"
4510 PRINT"/R12/CEEFAX OR ORACLE"
4520 GOSUB 7060
4530 C$="B": W1$="A": W2$="C": W3$="D"
4540 GOSUB 7230
4550 PRINT"/HCD7R3/THE MAJOR DIFFERENCE BETWEEN"
4560 PRINT"/R3/PRESTEL AND THE BROADCAST"
4570 PRINT"/R3/TELETEXT SYSTEMS CEEFAX AND"
4580 PRINT"/R3/ORACLE IS THAT USERS OF PRESTEL"
4590 PRINT"/R3/CAN COMMUNICATE WITH A COMPUTER"
4600 PRINT"/D1R3/IT IS THEREFORE AN INTERACTIVE"
4610 PRINT"/R3/TELETEXT SYSTEM"
4620 GOSUB 7120 : GOSUB 7630
4630 REM QUESTION 13 **************
4640 GOSUB 7570
4650 PRINT"/HCR10/WHICH MODE OF DATA"
4660 PRINT"/R19/TRANSMISSION IS USED"
4670 PRINT"/R19/TO TRANSMIT DATA TO"
4680 PRINT"/R19/PRESTEL USERS?"
4690 PRINT"/D2R11/A: SIMPLEX"
4700 PRINT"/D1R11/B: SYNCHRONOUS"
4710 PRINT"/D1R11/C: ASYNCHRONOUS"
4720 PRINT"/D1R11/D: DUPLEX"
4730 GOSUB 7060
4740 C$="C": W1$="A": W2$="B": W3$="D"
4750 GOSUB 7230
4760 IF Fl=1 THEN 4650
4770 PRINT"/CND7R3/THE PRESTEL TELETEXT SYSTEM"
4780 PRINT"/R3/OPERATES IN ASYNCHRONOUS MODE"
4790 PRINT"/R3/THAT IS, START/STOP TRANSMISSION"
4800 PRINT"/R3/IS USED"
4810 PRINT"/D1R3/EACH CHARACTER THAT IS TRANSMITTED"
4820 PRINT"/R3/IS COMPOSED OF 10 BINARY DIGITS"
4830 PRINT"/R3/OF WHICH 7 ARE USED FOR THE DATA,"
4840 PRINT"/R3/1 FOR PARITY AND 1 EACH FOR START"
4850 PRINT"/R3/AND STOP MARKS"
4860 GOSUB 7120 : GOSUB 7630
4870 REM QUESTION 14 **************
4880 GOSUB 7570
PRINT"/HCD1R4/THE NUMBER OF PAGES OF\nPRINT"/R4/INFORMATION AVAILABLE ON\nPRINT"/R4/PRESTEL IS CONSIDERABLY\nPRINT"/R4/HIGHER THAN THE OTHER\nPRINT"/R4/BROADCAST TELETEXT SYSTEMS\nPRINT"/DIR4/WHICH OF THE FOLLOWING\nPRINT"/R4/IS CORRECT?\nPRINT"/DIR4/A: 10,000 BUT LESS THAN 50,001\nPRINT"/DIR4/B: 50,000 BUT LESS THAN 100,000\nPRINT"/DIR4/C: 100,000 BUT LESS THAN 150,000\nPRINT"/DIR4/D: 150,000 BUT LESS THAN 250,000\nGOSUB 7060\nCS="D": W1$="A": W2$="B": W3$="C"\nGOSUB 7230\nIF Fl=1 THEN 4890\nPRINT"/HCD7R3/THERE ARE OVER 150 INFORMATION\nPRINT"/R3/PROVIDERS INVOLVED WITH THE\nPRINT"/R3/PRESTEL SYSTEM WHO HAVE BETWEEN\nPRINT"/R3/THEM BOOKED OVER 181,011 PAGES\nPRINT"/R3/OF SPACE (OCT. 1979)\nPRINT"/DIR3/IT IS ENVISAGED THAT THE SYSTEM\nPRINT"/R3/WILL EVENTUALLY SUPPORT OVER\nPRINT"/R3/ONE MILLION PAGES OF INFORMATION\nGOSUB 7120 : GOSUB 7630\nREM QUESTION 15 **************\nGOSUB 7570\nPRINT"/HCD1R8/WHAT IS THE NAME OF A\nPRINT"/R8/SIMILAR VIEWDATA SERVICE\nPRINT"/R8/PROVIDED BY THE CANADIAN\nPRINT"/R8/TELEPHONE AUTHORITY?\nPRINT"/DIR8/A: VIDEOTEX\nPRINT"/DIR8/B: ANTOPE\nPRINT"/DIR8/C: TELEDON\nPRINT"/DIR8/D: TV TEXT\nGOSUB 7060\nCS="C": W1$="A": W2$="B": W3$="D"\nGOSUB 7230\nIF Fl=1 THEN 5150\nPRINT"/HCD5R3/THE NAME OF THE VIEWDATA SERVICE\nPRINT"/R3/PROVIDED BY THE CANADIAN TELEPHONE\nPRINT"/R3/AUTHORITY IS /RV/TELEDON/RO/\nPRINT"/DIR3/OTHER COUNTRIES DEVELOPING\nPRINT"/R3/TELETEXT SYSTEMS ARE:*\nPRINT"/DIR10/- FRANCE (ANTIOPE)*\nPRINT"/DIR10/- GERMANY (BILDSCHIRMTEXT)*\nPRINT"/DIR10/- OTHER COUNTRIES SUCH AS JAPAN\nPRINT"/DIR10/- AND SWEDEN ARE ALSO DEVELOPING\nPRINT"/R3/SYSTEMS\nGOSUB 7120 : GOSUB 7630\nRETURN\nREM QUESTION 16 **************\nGOSUB 7570\nPRINT"/CHD4R8/WHICH OF THE FOLLOWING\nPRINT"/R8/ARE MIXED MEDIA SYSTEMS?\nPRINT"/DIR11/A: CYCLOPS\nPRINT"/DIR11/B: ORACLE\nPRINT"/DIR11/C: TELEDON\nPRINT"/DIR11/D: PLATO\nPRINT"/DIR10/>";A$
IF LEN(A$)=1 THEN 5700
IF LEN(A$)>2 THEN 5740
IF A$="AD" OR A$="DA" THEN 5650
C1$=LEFT$(A$,1)
C2$=RIGHT$(A$,1)
V1=ASC(C1$)
V2=ASC(C2$)
If V1<65 OR V1>68 OR V2<65 OR V2>68 THEN 5600
PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
PRINT"/D2/THE CORRECT ANSWER IS 'AD' OR 'DA'"
PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
PRINT"/D2/THE CORRECT ANSWER IS 'AD' OR 'DA'"
PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
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GOSUB 6968: GOTO 5680
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PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
PRINT"/D2/THE CORRECT ANSWER IS 'AD' OR 'DA'"
PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
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PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
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PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
PRINT"/D2/THE CORRECT ANSWER IS 'AD' OR 'DA'"
PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
PRINT"/D2/THE CORRECT ANSWER IS 'AD' OR 'DA'"
PRINT"/D2/NEVER MIND!"
GOSUB 6968: GOTO 5680
PRINT"/D2/THE CORRECT ANSWER IS 'AD' OR 'DA'"
PRINT/DIR11/B: BY KEYBOARD
PRINT/DIR11/C: BY LIGHT PEN
PRINT/DIR11/D: BY USE OF A DIGITISING TABLET
PRINT/D2/THE LETTERS THAT CORRESPOND TO YOUR ANSWERS:
INPUT/DIR11/>>: A$
IF A$="DCB" OR A$="DBC" THEN 6230
IF A$="BCD" OR A$="BCD" THEN 6230
IF A$="CBD" OR A$="CDB" THEN 6230
IF LEN(A$)<3 THEN 6250
IF LEN(A$)>3 THEN 6280
PRINT/CHD3/SORRY BUT THIS IS NOT CORRECT: F2=0
PRINT/CHD3/THE CORRECT ANSWER IS BCD:
GOSUB 6960: GOTO 6J00
PRINT/CHD3/YES - YOU HAVE IT: F2=1
GOTO 6210
PRINT/CHD3/YOU HAVEN'T TYPED ENOUGH LETTERS:
PRINT/D2/HAVE ANOTHER TRY:
GOSUB 6960: GOTO 6240
PRINT/CHD3/YOU HAVE TYPED TOO MANY LETTERS:
GOTO 6250
PRINT/CHD3/IN THE MIXED MEDIA SYSTEMS:
PRINT/R6/DESCRIBED, WHAT IS THE NAME:
PRINT/R6/OF THE PERSON RESPONSIBLE:
PRINT/R6/FOR PREPARING MATERIAL FOR:
PRINT/R6/TRANSMISSION TO THE USER:
PRINT/D2R8/A: INFORMATION PROVIDER:
PRINT/D2R8/B: EDITOR:
PRINT/D2R8/C: AUTHOR:
PRINT/D2R8/D: TELETEXT CONTROLLER:
GOSUB 7120: GOSUB 7630
REM QUESTION 19 ************
GOSUB 7570
PRINT/CHD5R6/W1S= "A": W2S="B": W3S="D"
GOSUB 7230
IF F1=1 THEN 6400
PRINT/CHD7R6/THE PERSON RESPONSIBLE FOR:
PRINT/R6/PREPARING MATERIAL FOR:
PRINT/R6/TRANSMISSION TO THE USER IS:
PRINT/R6/CALLED AN /RV/AUTHOR/RO/
PRINT/D1R6/THE AUTHOR'S STUDIO CONTAINS:
PRINT/R6/FACILITIES FOR PRODUCING AUDIO:
PRINT/R6/RECORDINGS, PHOTOGRAPHS AND:
PRINT/R6/CONVERTING THEM TO COMPUTER:
PRINT/R6/READABLE FORMAT:
PRINT/D1R6/ALSO A COMPUTER:
PRINT/R6/THERE IS ALSO A COMPUTER:
PRINT/R6/TERMINAL TO TRANSMIT, MODIFY:
PRINT/R6/AND UPDATE THE INFORMATION: GOSUB 7120: GOSUB 7630
REM QUESTION 20 ************
GOSUB 7570
PRINT/CHD5R6/WHO ARE LIKELY TO BE USERS:
PRINTER/DIR6/"TELETEXT SYSTEMS IN"
PRINTER/DIR6/"THE FUTURE?"
PRINTER/DIR6/"DIRE/A: BUSINESS ORGANISATIONS"
PRINTER/DIR6/"B: HOUSEWIVES"
PRINTER/DIR6/"C: SCHOOLS AND COLLEGES"
PRINTER/DIR6/"D: ALL OF THE ABOVE"
GOSUB 7680
CS=D; W1$="A"; W2$="B"; W2$="C"
GOSUB 7230
IF F1=1 THEN
PRINT/CHD3/"TELETEXT SYSTEMS WILL BE USED"
PRINT/WIDELY IN SOCIETY IN THE FUTURE"
PRINT/BUSINESS ORGANISATIONS FOR EXAMPLE"
PRINT/WILL USE IT FOR INFORMATION ON"
PRINT/THE ECONOMY, SHARE PRICES, TECHNICAL"
PRINT/AND SCIENTIFIC INFORMATION"
PRINT/HOUSEWIVES WILL USE IT FOR"
PRINT/ELECTRONIC SHOPPING, I.E. COMPARING"
PRINT/PRICES OVER THE TV SCREEN, FOR"
PRINT/ENTERTAINMENT AND TRAVEL INFORMATION"
PRINT/IN EDUCATION WILL"
PRINT/EVENTUALLY COVER ALL SUBJECTs,"
PRINT/PROVIDE CAREER GUIDANCE AND ENABLE"
PRINT/PERSOAL COMPUTING TO BE DONE"
PRINT/IN THE HOME"
GOSUB 7120: GOSUB 7630
RETURN
REM WAIT FOR 5 SECONDS
LIM5=TI+5*60
IF TI<LIM5 THEN 6980
RETURN
REM ************************************
REM GETANSWER FROM RESPONDENT
PRINT/DIR1/"TYPE THE LETTER THAT CORRESPONDS TO YOUR ANSWER:"
INPUT/RV/>> /RO/; A$
IF A$="HELP" OR A$="H" OR A$="GO" OR A$="G" THEN 7210
GOSUB 7680
GOTO 7138
7110 REM
REM WAITGO - WAIT FOR GO MESSAGE
PRINT/DIR4RV/ /RO/ "
PRINT/R4RV/ TYPE GO OR HELP WHEN YOU ARE /RO/"
PRINT/R4RV/ READY TO PROCEED: "
PRINT/R4RV/ "
INPUT/DIR12RV+/RO/; GS
IF GS="HELP" OR GS="H" OR GS="GO" OR GS="G" THEN 7210
GOSUB 7680
GOTO 7138
7110 REM
REM REM SET FLAG
IF A$=CS THEN 7330
IF A$=W1$ OR A$=W2$ OR A$=W3$ THEN 7370
KI(K)=KI(K)+1
PRINT/CND1/"INVALID ANSWER"
PRINT"/D3/PLEASE CHOOSE FROM THE FOLLOWING:"  
PRINT"/D2/ A,B,C or D"  
PRINT"/D2/TRY THIS QUESTION AGAIN"  
GOSUB 6960 : F1=1 : RETURN  
PRINT"/CHD4/WELL DONE - YOU'RE RIGHT" : F2=1  
PRINT"/D3/THE ANSWER IS "+C$  
GOSUB 6960  
GOTO 7390  
PRINT"/CHD4/NO - YOU ARE INCORRECT" : F2=0  
GOTO 7340  
PRINT"/CHD4/BEFORE WE PROCEED"  
PRINT"/D1/LET'S CHECK THROUGH THE ANSWER"  
GOSUB 6960  
RETURN  
REM ******************  
REM LINK FRAME 1  
REM ******************  
PRINT"/CHD12/HERE IS A QUESTION ON WHAT YOU HAVE SEEN"  
GOSUB 6960  
RETURN  
REM ******************  
REM LINK FRAME 2  
REM CLEAR THE SCREEN  
REM GO BACK TO SLIDES  
PRINT"/CHD1/NOW LET'S LOOK AT SOME MORE SLIDES"  
RETURN  
REM ******************  
PRINT"/CHD6/THIS IS THE HELPER"  
PRINT"/CHD7/IF YOU ARE HAVING DIFFICULTY"  
PRINT"/CHD8/WITH THIS QUESTION YOU WILL FIND"  
PRINT "SOME FURTHER READING MATERIAL IN THE"  
PRINT"/D2R4RV/"  
PRINT"/R4HV/ TELETEXT GUIDEBOOK /RO/"  
PRINT "/RO/"  
PRINT "/RV/"  
PRINT "/D2/THAT IS LOCATED NEXT TO YOUR TERMINAL."  
PRINT "/D3/EXAMINE THE FOLLOWING PAGES:"  
PRINT "/D1R1RV/ "+G$+" /RO/"  
INPUT"/D2R2/TYPE /RV/GO/RO/ TO PROCEED" ;G$  
IF G$="GO" OR G$="G" THEN 7850  
INPUT "/CHD6/INVALID REPLY"  
PRINT "/D2R2RV/GO ASSUMED/RO/"  
GOSUB 6960  
RETURN  
PRINT"/U7/"  
PRINT"/R4/"  
PRINT "/R4/INVALID REPLY"
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7890 PRINT "/R4/VALID ANSWERS ARE: 
7900 PRINT"/R4/ 
7910 PRINT 
7920 PRINT 
7930 GOSUB 6960
7940 PRINT "/U7/" 
7950 RETURN 
7960 REM INITIALISATION DATA 
7970 FOR I=1 TO 7: READ PA(I):NEXT I 
7980 DATA 7,16,23,28,35,50,65
7990 FOR I=1 TO 20: READ PGS(I): NEXT I 
8000 DATA 9,15,16 AND 17",11,13,18 
8010 DATA 23,29,27,24,30 
8020 DATA 34,33,35,39,33 
8030 DATA 44,45,*50 52 AND 54*,56,57 
8040 RETURN 
8050 PRINT "/CD3/END OF PRESENTATION" 
8060 PRINT "/D2/PRESS STOP ON THE CARAMATE" 
8070 PRINT "/D2/PRESS REWIND ON THE CARAMATE" 
8080 GOSUB 6960
8090 POKE 59471,5 
8100 TF=TI 
8110 CR=0 : KS=0 
8120 TP=INT((TF-TS)/3600+0.5) 
8130 FOR J=1 TO 20 
8140 CR=CR+M(J) 
8150 KS=KS+KI(J) 
8160 TA(J)=INT(TA(J)+0.5) 
8170 NEXT J 
8180 PRINT "/CHD6/HERE ARE YOUR COURSE STATISTICS." 
8190 INPUT "/D2/IS A PRINTER AVAILABLE";A$ 
8200 IF A$="YES" OR A$="NO" THEN 8220 
8210 PRINT "/D2/INVALID REPLY":PRINT "PLEASE ANSWER YES OR NO" 
8220 REM IF ANSWER IS YES OPEN PRINTER 
8230 REM ELSE PUT ANALYSIS ON SCREEN 
8240 IF A$="NO" THEN 8580 
8250 OPEN 1,4 
8260 FOR J=1 TO 10:PRINT$1,":NEXT J 
8270 PRINT$1, "NAME: ";NAME$ 
8280 PRINT$1,":NAME$ 
8290 PRINT$1, "COURSE CODE: ";BS 
8300 PRINT$1, "TIME FOR PRESENTATION: ";TF;" MINUTES" 
8310 PRINT$1, "NUMBER OF CORRECT ANSWERS: ";CR 
8320 PRINT$1, "NUMBER OF INCORRECT ANSWERS: ";20-CR 
8330 PRINT$1, "NUMBER OF INCORRECT KEY-INS: ";KS 
8340 PRINT$1, ":PRINT$1" 
8350 PRINT$1,"QUESTION TIME KEYINGS MARK HELP AND" 
8360 PRINT$1, "GAMES");NEXT J 
8370 FOR J=1 TO 20 
8380 GOSUB 8580 
8390 PRINT$1,JS;TAB(6);TA$;TAB(3);KI(J);TAB(3);M(J);TAB(3);HR(4);AP$(J) 
8400 NEXT J 
8410 PRINT$1, "-----------------------------" 
8420 FOR J=1 TO 30 
8430 PRINT$1, " " 
8440 NEXT J 
8450 CLOSE 1 
8460 PRINT "/CHD6/PLEASE DETACH THE PRINTED LISTING"
8470 PRINT "AND ATTACH IT TO YOUR QUESTIONNAIRE"
8480 INPUT "/D2R2/TYPE /RV/GO/RO/ TO PROCEED"; G$
8490 GOTO 8900 ; REM LAST FRAME
8500 J$=STR$(J)
8510 IF LEN(J$)=3 THEN 8510
8520 H$=" +J$
8530 AP$(J)=" +AP$(J)
8540 TA$=STR$(TA(J))
8550 IF LEN(TA$)=3 THEN 8570
8560 TA$=" +TA$
8570 RETURN
8580 REM CODE TO DISPLAY STUDENT'S STATISTICS ON VDU
8590 PRINT " /CHD8/ BECAUSE THERE IS NO PRINTER."
8600 IF LEN(TA$)=3 THEN 8610
8610 PRINT " ATTACHED TO THE EQUIPMENT YOU WILL"
8620 PRINT " HAVE TO COPY YOUR ANSWER PROFILE."
8630 INPUT " /D2/ TYPE /RV/GO/RO/ TO PROCEED"; G$
8640 PRINT " /CHD2/COPY THE FOLLOWING RESULTS TO /
8650 PRINT " /RV/FORM A/RO/ ON YOUR QUESTIONNAIRE "
8660 PRINT " /CHD2/NAME: \NAME$:
8670 PRINT " /D1/ COURSE CODE: \B$:
8680 PRINT " /D1/ TIME FOR PRESENTATION: \TP; MINUTES"
8690 PRINT " /D1/ NUMBER OF CORRECT ANSWERS: \CR"
8700 PRINT " /D1/ NUMBER OF INCORRECT KEY-INS: \KS"
8710 INPUT " /D3/ TIME FOR PRESSENTATION: \TP; MINUTES"
8720 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8730 PRINT " QUESTIONS YOU HAVE ANSWERED:"
8740 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8750 PRINT " QUESTIONS YOU HAVE ANSWERED:
8760 INPUT " /D2/ TYPE /RV/GO/RO/ TO PROCEED"; G$
8770 FOR L2=1 TO 4
8780 PRINT " /CHD2R2/ QUESTION TIME KEY-INS MARK HELP ANSWERS"
8790 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8800 PRINT " QUESTIONS YOU HAVE ANSWERED:"
8810 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8820 PRINT " QUESTIONS YOU HAVE ANSWERED:"
8830 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8840 PRINT " QUESTIONS YOU HAVE ANSWERED:"
8850 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8860 PRINT " QUESTIONS YOU HAVE ANSWERED:"
8870 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8880 PRINT " QUESTIONS YOU HAVE ANSWERED:"
8890 PRINT " /CHD4/ HERE IS THE ANSWER PROFILE FOR THE"
8900 PRINT " QUESTIONS YOU HAVE ANSWERED:"
8910 PRINT " /CHD4/ HERE IS THE END OF THE DIALOGUE"
PRINT L2$=L2$"/RVG191/"
9070 L2$="/RVG191RO/" : L2$="/RVG191RO/"
9080 T1$="/RVG032RO/" : T1$="/RVG032RO/"
9090 E1$="/RV/RO/" : E1$="/RV/RO/"
9100 X1$="/RV/RO/" : X1$="/RV/RO/"
9110 X2$="/RVG032RO/" : X2$="/RVG032RO/"
9120 X3$="/RV/RO/" : X3$="/RV/RO/"
9130 X4$="/RVG169RO/" : X4$="/RVG169RO/"
9140 X5$="/RVG032RO/" : X5$="/RVG032RO/"
9150 X5$="/RVG032RO/" : X5$="/RVG032RO/"
9160 X5$="/RVG032RO/" : X5$="/RVG032RO/"
9170 X5$="/RVG032RO/" : X5$="/RVG032RO/"
9180 X5$="/RVG032RO/" : X5$="/RVG032RO/"
9190 PRINT "/CHD1/"
9200 PRINT L1$
9210 PRINT L2$
9220 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9230 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9240 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9250 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9260 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9270 PRINT L1$
9280 PRINT L2$
9290 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9300 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9310 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9320 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9330 PRINT L1$+L2$+L1$+L2$+L1$+L2$+L1$+L2$
9340 PRINT L1$
9350 PRINT L1$
9360 PRINT /A COMPUTER ASSISTED LEARNING EXPERIMENT" /RV/ PRESS RETURN KEY TO CONTINUE/RO/"
9370 PRINT /D1/ /RV/ PRESS RETURN KEY TO CONTINUE/RO/"
9380 GET Z$: IF Z$="" THEN 9380
9390 RETURN
SECTION 2

THE GUIDEBOOK
INTRODUCTION

The major purpose of the 'GUIDEBOOK TO TELETEXT SYSTEMS' which is illustrated in this section is to provide remedial material to which the student may be directed by the computer.

The subject of 'Teletext Systems' was chosen as being one that would be of interest to second year Computer Science students who were the initial target audience for the CAL experiments.

The Guidebook contains most of the artwork used to produce the 35mm slides. Certain colour slides used in the experiment could not be reproduced because of the limitations of the reprographic facilities available. Additional black and white illustrations and text were therefore included in the Guidebook in order to remedy this omission.

In addition to providing remedial material, other uses of the Guidebook are:

(1) To introduce the topic of 'Teletext Systems' to the student using the CAL programme. This reduced the need to program and present some introductory material on the microcomputer screen.

(2) To familiarise the student with the general objective of the CAL experiment. That is, to enable the student to understand the various types of teletext system produced as a result of the converging technologies of television, telecommunications and electronic data processing.

(3) To specify the learning objectives of the multi-media CAL package. A list of general and learning objectives was presented in Sections 6.31 and 6.32 respectively of Chapter 6, Volume I.

(4) To provide additional text and diagrams to enlarge upon the learning materials provided by 35mm slides, the audiotape and the textual material displayed on the microcomputer screen.
(5) Finally, to direct the student to a wider range of materials on the subject. Such references are given on page 58 of the Guidebook.

It was intended to keep the textual material in the Guidebook up-to-date by storing it in a large mainframe computer with text processing facilities.

Copies of the Guidebook were given to all students and staff who participated in the experiments. Participants were invited to comment on the information contained in the Guidebook by completing a questionnaire. The questionnaire and relevant summary of answers (see Question 15) can be found in Section 6.43 in Chapter 6, Volume I.
GUIDEBOOK

to

TELETEXT SYSTEMS

A COMPUTER ASSISTED TAPESLIDE PROGRAMME

BY

DR. PHILIP G. BARKER & HARRY YEATES, ACMA, MBCS.
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One of the most exciting developments in television technology in recent years has been a British development - TELETEXT.

TELETEXT is the name given to the broadcasting of readable pages of information on to your television screen via a coded signal.

With the perversity of most great inventions, teletext was found by someone looking for something completely different........

A BBC engineer was trying to improve the lot of deaf viewers by somehow adding subtitles on to programmes.

He came up with the idea of using a couple of unused lines at the top of your TV screen to convey coded information.

A device in the TV receiver would 'decode' the instructions, generate the required letters and put them in the required place on the screen.

A brilliant idea, which rapidly evolved till today's broadcast magazines (TELETEXT) were tested, modified and opened for public service in its present form in 1974.
In this tapealide presentation we will look at the subject of communication between one human and another and show how TELETEXT SYSTEMS in conjunction with computer systems can help solve some of the problems of communication over geographically large areas and how such systems may be employed for the future education of society on a local, national or world-wide basis.

*******************
THE PURPOSE OF THE COMPUTER ASSISTED TAPESLIDE PROGRAMME ON TELETEXT SYSTEMS

General Objectives

To give you a general appreciation and understanding of:

1. The creation of various types of teletext system by the merging technologies of television, telecommunications and electronic data processing.
2. The role of teletext systems in solving some communication problems.
3. The anticipated employment of such systems for the future education of society.

Learning Objectives

To understand:

1. The major limitation, i.e. the lack of interaction in some of our present methods of communication.
2. The methods of operation of the BBC and IBA broadcast teletext systems.
3. The differences, and similarities between these systems and the Post Office interactive viewdata system called PRESTEL.
4. The meaning of the term "mixed media systems".
5. How these mixed media systems are being developed for the future education of society.
THE PURPOSE OF THE GUIDEBOOK

Information on the subject of TELETEXT SYSTEMS will be presented to you in the following order:

1. By 35mm slides which illustrate with pictures and diagrams the various types of TELETEXT SYSTEMS.

2. By an audio tape commentary which is synchronised with the slides.

3. By information presented on the screen of the microcomputer which is programmed to stop the tapeslide presentation at certain points and check your understanding of what you have seen and heard.

To achieve the general and learning objectives set out on the previous page it is strongly recommended that you do not read the guidebook beyond this page now and only refer to it after you have followed the presentation sequence in 1 - 3 above.

The major purpose of the guidebook is to assist you in understanding the material presented by the tapeslide programme and the computer which will direct your attention to various pages of the guidebook when necessary.

Use of the guidebook in any other way will defeat this purpose.
WHAT IS COMMUNICATION?

Communication, in general, serves a number of purposes:

(a) to act as a stimulus between a source and a recipient of a message,
(b) to act as a carrier of information,
(c) to create interactions and relationships,
(d) to influence the behaviour of some entity.

During their everyday lives people need to communicate one with another. The purpose of communication usually is to disseminate information. This information may be used as a means of solving problems or for carrying on conventional social discourse. Alternatively, it may be used purely for its entertainment value.

It is important to understand the purposes of communication in order that suitable techniques and methods may be employed to aid the transfer of material.
THE MEANS OF COMMUNICATION

People communicate in a variety of ways: through talking and listening, through writing, by drawing pictures and diagrams, and, of course, by reading. Very often listening to a radio broadcast or watching a television programme can constitute very effective methods of receiving information.
Communication is the transmission of information from a source to a destination via a suitable communication channel.

It can be a one-way or two-way process.
Reading a book, listening to the radio or watching television are examples of one-way methods of communication. Their major disadvantage is that you cannot ask them a question, that is, there is no interaction.

Study the above diagram which shows all the elements in the communication process. Feedback is a term used to describe the reaction of the recipient to a message. There are many methods of transmitting and receiving information. The chances of a message reaching its audience, being retained and influencing subsequent behaviour are greater if several means are used simultaneously.
TWO-WAY COMMUNICATION

HELLO JACK

HI JENNY

TELEPHONE

LETTER

TAPE RECORDING

NOTICE IN EXAMPLE 'C' ABOVE HOW TWO DIFFERENT CHANNELS MAY BE USED TO CARRY INFORMATION.
THREE BROAD TYPES OF TELETEXT SYSTEM ARE DISCUSSED IN THIS PROGRAMME.

TELETEXT SYSTEMS

A
ONE WAY COMMUNICATION USING A TELEVISION CHANNEL

B
TWO WAY COMMUNICATION USING A TELEPHONE NETWORK

C
TWO WAY COMMUNICATION USING BOTH A T.V. CHANNEL AND A TELEPHONE NETWORK

N.B. THE BROADCAST TELETEXT SYSTEMS "CEEPAX" AND "ORACLE" ARE EXAMPLES OF THIS TYPE.
Information that is stored within a computer system is relayed via a broadcasting station and a TV channel to possible users of that information. These users may be located in a school or a college, in their own home or in the business or industrial sector.

The computer system is able to store large quantities of information on a variety of topics and subject areas. Users of the system are provided with a simple push-button device attached to their TV set to enable them to select the information that they wish to have displayed.
Here is a simplified diagram of the keypad used to select information:

It can operate in two modes: TV or TELETEXT. The mode to be used is selected by pressing an appropriately coloured button, say green for TV and red for teletext. When in teletext mode the user can press the numbered buttons, 1, 2, 3... up to 9 in any sequence to form a numeric code consisting of several digits. This code is used to specify which information the user wishes to have displayed on the screen as shown in the examples above.

Examples of other codes used will be found on page ... 20.
ADDITIONS TO DOMESTIC TV RECEIVER TO RECEIVE TELTEXT
"CEEFAX" is the name given to the teletext service broadcast by the BBC from its own newsroom in the BBC Television Centre in London. Why was the service called 'CEEFAX'? For the answer see page... 17
'ORACLE' is the name given to the Independent Broadcasting Authority's teletext system.

Why 'ORACLE'? See answer on page 17.
CEEFAX (See Facts) is the name of the BBC system with information being broadcast over BBC 1 and BBC 2.

The IBA's system is called ORACLE which is an acronym for Optical Reception of Announcements by Coded Line Electronics.

The user is not restricted to one or the other. He may use either system to obtain the information that he needs.
The information that is stored within the computer system and which is relayed to the TV screen is organised as a collection of pages.

The viewer examines one page of information at a time on his TV screen. Each page of information contains a page number to enable it to be uniquely identified. It also carries a date which tells the user the age of the information that the page carries.
RAIN OR SHINE?
NEW SOURCE OF ENERGY FOUND?
WHO WON THE DERBY?
TODAY’S BEST FOOD BuYS?
WHAT’S ON AT THE CINEMA?

HERE IS AN EXAMPLE OF A PAGE OF INFORMATION FROM THE ORACLE TELETEXT SYSTEM. AS CAN BE SEEN FROM THE TOP LEFT-HAND SIDE THIS IS PAGE 106.

THIS PAGE IS A TYPE OF ADVERTISEMENT PAGE TO INFORM USERS ABOUT SOME OF THE TYPES OF INFORMATION THAT THEY CAN OBTAIN FROM THE SYSTEM. FOR EXAMPLE:

- THE WEATHER REPORT
- RECENT SCIENTIFIC OR SPORTING ACHIEVEMENTS
- WHERE TO BUY FOOD AT ECONOMIC PRICES
- GUIDES TO THE THEATRE OR CINEMA.
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>MAIN INDEX</td>
<td></td>
</tr>
<tr>
<td>1001</td>
<td>FILMS ON ITV</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>FULL INDEX A·E</td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>FULL INDEX F·L</td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>FULL INDEX M·R</td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>FULL INDEX S·Z</td>
<td></td>
</tr>
<tr>
<td>173</td>
<td>LONDON ITV PROGRAMMERS</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>MAIN NEWS INDEX</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>NEWS HEADLINES</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>SPORT HEADLINES</td>
<td></td>
</tr>
<tr>
<td>203</td>
<td>BUSINESS HEADLINES</td>
<td></td>
</tr>
<tr>
<td>224</td>
<td>SHARE PRICES</td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>FT INDEX</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>WHAT'S ON INDEX ITV REGIONS</td>
<td></td>
</tr>
<tr>
<td>301307</td>
<td>ANGLIA</td>
<td>600</td>
</tr>
<tr>
<td>309315</td>
<td>ATV</td>
<td>604-606</td>
</tr>
<tr>
<td>317323</td>
<td>BORDER</td>
<td>610</td>
</tr>
<tr>
<td>324329</td>
<td>CHANNEL</td>
<td>616</td>
</tr>
<tr>
<td>331337</td>
<td>GRAMPIAN</td>
<td>620</td>
</tr>
<tr>
<td>339345</td>
<td>GRANADA</td>
<td></td>
</tr>
<tr>
<td>347353</td>
<td>HTV</td>
<td></td>
</tr>
<tr>
<td>355361</td>
<td>SCOTTISH</td>
<td>700</td>
</tr>
<tr>
<td>352369</td>
<td>SOUTHERN</td>
<td>703</td>
</tr>
<tr>
<td>371377</td>
<td>TYNE TEES</td>
<td>710</td>
</tr>
<tr>
<td>379383</td>
<td>ULSTER</td>
<td>715</td>
</tr>
<tr>
<td>384390</td>
<td>WESTWARD</td>
<td>726-727</td>
</tr>
<tr>
<td>392398</td>
<td>YORKSHIRE</td>
<td>750</td>
</tr>
<tr>
<td>400</td>
<td>WEATHER AND TRAVEL INDEX</td>
<td></td>
</tr>
<tr>
<td>4001</td>
<td>WEATHER MAP</td>
<td></td>
</tr>
<tr>
<td>4006</td>
<td>WORLD WEATHER</td>
<td></td>
</tr>
<tr>
<td>410</td>
<td>MOTORWAY NEWS</td>
<td></td>
</tr>
<tr>
<td>413</td>
<td>AIR NEWS</td>
<td></td>
</tr>
<tr>
<td>415</td>
<td>TRAVEL FLASH</td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>STAND BY HOLIDAYS</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>ADVERTISING INDEX</td>
<td></td>
</tr>
<tr>
<td>504</td>
<td>TRADE FAIRS AND EXHIBITION</td>
<td></td>
</tr>
<tr>
<td>506</td>
<td>ARTS ROUND-UP</td>
<td></td>
</tr>
<tr>
<td>550</td>
<td>CALENDAR</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>ORACLE JUNIOR INDEX</td>
<td></td>
</tr>
<tr>
<td>604606</td>
<td>LOOK AND SAY READING</td>
<td></td>
</tr>
<tr>
<td>610</td>
<td>OK NEWS</td>
<td></td>
</tr>
<tr>
<td>616</td>
<td>JOKES</td>
<td></td>
</tr>
<tr>
<td>620</td>
<td>TREASURE TRAIL</td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>LEISURE MAGAZINE INDEX</td>
<td></td>
</tr>
<tr>
<td>703</td>
<td>PUZZLES AND QUIZZES</td>
<td></td>
</tr>
<tr>
<td>710</td>
<td>RECORDS - TOP TEN</td>
<td></td>
</tr>
<tr>
<td>715</td>
<td>HOROSCOPES</td>
<td></td>
</tr>
<tr>
<td>726-727</td>
<td>RECIPES</td>
<td></td>
</tr>
<tr>
<td>750</td>
<td>TECHNICAL INDEX</td>
<td></td>
</tr>
<tr>
<td>760</td>
<td>AMATEUR RADIO</td>
<td></td>
</tr>
<tr>
<td>777</td>
<td>ENGINEERING INFORMATION NEWS.</td>
<td></td>
</tr>
</tbody>
</table>
THIS IS CEEFAX PAGE 100. IT IS AN INDEX PAGE.

AN INDEX PAGE IS USED TO PROVIDE A SUMMARY OF THE CATEGORIES OF INFORMATION THAT THE SYSTEM CONTAINS AND SHOWS THE PAGE NUMBERS TO BE USED IN ORDER TO ACCESS ANY PARTICULAR CATEGORY.

NOTICE THAT THE ENTRY ON THE TOP RIGHT HAND SIDE READS:

WEATHER MAP .................115

IF THE PAGE NUMBER 115 WAS TO BE ENTERED ON THE KEYPAD THE INFORMATION SHOWN ON THE FOLLOWING PAGE OF THIS GUIDEBOOK WOULD BE DISPLAYED.
This is CEEFAX page 115.

It displays a simple picture that represents a weather map of the United Kingdom. We see here how simple graphic techniques can be used to disseminate information that is easy for its user to assimilate and understand.

You will remember that the slide illustrated this weather map in colour as would be the case from any ordinary domestic colour television set. In practice, yellow would be used for areas having temperatures below 20 degrees centigrade while red is used to indicate areas having temperatures above this limit.

This is an example of where colour can be used to good advantage to emphasise particular facets of the information being displayed.
TELETEXT TRANSMISSION COLOURS

Mixing the primary colours and adding white gives us the seven teletext transmission colours which are standard on all types of teletext systems:

RED
GREEN
BLUE
CYAN
MAGENTA
YELLOW
WHITE

The main purpose of colour is to provide the user with an effective means of discovering, identifying and relating information quickly and efficiently. Colour can be used to help format certain sections of the screen that need to be separated visually - headings, for example can be displayed in blue while data fields are displayed in contrasting colours. Specific information can be very effectively highlighted in colour.

People find the use of colour pleasing and attractive and the use of colour greatly adds interest to graphical and textual presentations.
THE FORMATION OF GRAPHICS ON TELETEXT SCREENS

Study the diagram below which reproduces the slide which you saw illustrated on the screen:

The ORACLE Display – a schematic showing how the alphanumerics and graphics are formed.

Notice that graphics are formed by assembling small illuminated rectangles which are each one sixth of the size of the space occupied by a standard character. This gives them a 'square edged' appearance.
This illustration shows how graphics can be used to catch the attention and illustrate a theme. They can also play a significant part in clarifying information, particularly in conjunction with the colour facility.
A normal television set is built to receive a picture constructed from 625 lines. Not all of these are actually used to carry the picture that the viewer sees. Some of them are used to carry engineers' test signals, others are used for teletext data upon which the systems CEEFAX and ORACLE depend. A few of the lines that the viewer does not normally see are used to encode the digital information broadcast by the teletext system.

The information contained in the signals that are broadcast is represented as a pattern of binary electrical pulses.
TELETEXT DATA ORGANISATION

Study the diagram below which reproduces the illustration you saw on the slide projector screen.

ORACLE data organisation

Notice that each CHARACTER transmitted requires 8 binary digits.

Although the diagram is entitled 'ORACLE' Data Organisation it should be noted that this type of data organisation, the use of standard colours and of standard transmission rates is all part of the standard specifications agreed for TELETEXT systems.
BELOW IS A SUMMARY OF THE PAGE DETAILS THAT ARE TRANSMITTED BY THE ORACLE
AND CEEFAX SYSTEMS. REMEMBER THAT CURRENTLY CEEFAX ONLY HAS 100 PAGES.

<table>
<thead>
<tr>
<th><strong>SUMMARY OF ORACLE PAGE DETAILS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SINGLE PAGES</strong></td>
</tr>
<tr>
<td><strong>MULTIPAGE EXTENSIONS</strong></td>
</tr>
<tr>
<td><strong>TIME CODED PAGE EXTENSIONS</strong></td>
</tr>
<tr>
<td><strong>COLOURS FOR BACKGROUNDS</strong></td>
</tr>
<tr>
<td><strong>'GRAPHICS CHARACTERS'</strong></td>
</tr>
<tr>
<td><strong>CHARACTERS PER ROW</strong></td>
</tr>
<tr>
<td><strong>ROWS PER PAGE</strong></td>
</tr>
<tr>
<td><strong>ROW TRANSMISSION RATE</strong></td>
</tr>
<tr>
<td><strong>CYCLE TRANSMISSION OF PAGES</strong></td>
</tr>
</tbody>
</table>
THE MAJOR DIFFERENCE BETWEEN THE BBC 'CEEFAX' AND IBA's 'ORACLE' SYSTEM

The ORACLE system has about 800 pages compared with the CEEFAX system which has only 100.

The pages are transmitted one after another in a cyclic fashion until after about 25 seconds a complete magazine of 100 pages ('CEEFAX' system) has been transmitted. The whole process then begins all over again. The BBC limits its magazine size in order to keep access time down to a minimum.

Because a large number of pages are transmitted, the access time for a page on the 'ORACLE' system is usually greater than that for 'CEEFAX'.

The philosophy adopted by the IBA is based upon the assumption that users will want relatively quick access to much used pages of information such as news headlines, and indexes, but will be prepared to wait a little longer for less frequently used pages - such as horoscopes.

Thus in order to keep the access time for news headlines and index pages to a minimum, pages containing this type of information are transmitted more frequently in the transmission cycle than are the less important pages.
TELETEXT EDITING OPERATIONS

At the broadcasting transmission station (BBC or ITV), sub editors enter information and news stories into the computer's memory (or store) using special devices known as Visual Display Units (VDU's).

There are several VDU's in the editing suite and each has an electronic keyboard connected to a television monitor.

As a journalist types in information, so the words and symbols appear on the screen before him. There is no paper copy as there would be on an ordinary typewriter.

The news stories that appear through the teletext systems are sub-edited from information that pours into the newsroom on a bank of teletypewriters operated by the GPO 'TELEX' service. It takes only a few minutes to prepare a typical teletext page and individual items can be updated in seconds. So with these systems the user is able to get the information he wants and furthermore he can be certain that it is always up-to-date - perhaps no more than a few minutes, or even seconds old.

In addition to the use of the keyboard to write words and figures on to the screen, the sub-editors have only to press the correct keys in order to:

- Produce the graphical shapes of maps, diagrams and bold headlines;
- Select appropriate colours for words and symbols;
- Make parts of the page 'flash' on and off;
- Conceal or release parts of a page as the user requires.
Here is an example of an editing terminal.

This example shows the ORACLE editorial suite.

The ORACLE editorial suite at London Weekend Television—written information on a visual display unit is converted to ORACLE data signals by a small computer.
The 'CEEFAX' editing system works in exactly the same way. The news editors type in new facts or information which replaces that which is out of date. In this way users of the system always receive accurate, up-to-date information.
TELETEXT SYSTEMS

A

BROADCAST TELETEXT

(a) CEEFAX
(b) ORACLE

TELETEXT SYSTEMS

B

VIEWDATA SYSTEMS

(a) PRESTEL - UK
(b) ANTOPE - FRANCE
(c) BILDSCHIRMTEXT - GERMANY
(d) TELIDON - CANADA

ETC.

The second category of teletext system with which this programme deals depends upon the use of conventional telephone networks to transmit the information from one point to another. Generally, such systems are referred to as 'Viewdata' or 'Videotex' systems.

Within the United Kingdom the service offered by the British Post Office is called 'PRESTEL.' A similar service provided by the French Telephone Authorities is called Antiope. Most other countries, such as Germany, Canada and Japan also have similar viewdata systems.
PRESTEL

This is the registered trade name of the Post Office Teletext System. The system was originally called VIEWDATA but as there were several other viewdata systems operating in other parts of the world the name was subsequently changed to PRESTEL.

At the time of writing PRESTEL is only being operated on an experimental basis in certain regions. It is expected to be launched nationally by mid-1980.
Here is the diagram from which the slide was produced. Notice the telephone network which is fundamental to the successful operation of the Viewdata system. Information flows through the network at two different speeds. Transmission is at 1200 bits/second in receive mode and 75 bits/second in transmit mode from the user's terminal.

Conventional asynchronous start/stop transmission is used. Each character that is transmitted is composed of 10 bits of which 7 are used for the data, 1 for parity and one each for start and stop marks.
There are almost 200,000 pages of information contained within the PRESTEL system. This information is organised logically in the form of a tree structure. Users of the system search for the information page they require by examining the main index or various sub-indexes. The user is thus guided from one level of the tree to the next via the index. It is possible to bypass the routing structure and go directly to the page required if the user knows the appropriate page number of the information he requires. Page numbers may be found from the Prestel Users' Guide which is similar to a telephone directory.
This is a typical remote control keypad manufactured for the users of the 'PRESTEL' system.
THE FLOW OF INFORMATION IN A VIADATA SYSTEM

COMPUTER SYSTEM

COMPUTER STORE

TELEPHONE NETWORK

TELEPHONE

TELEVISION SET

KEYPAD

INFORMATION PROVIDER

INFORMATION USER
There are over 150 information providers who have between them booked over 100,000 pages of information space. Some examples are shown above.

<table>
<thead>
<tr>
<th>INFORMATION PROVIDER</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCITEL (INSTITUTE FOR SCIENTIFIC INFORMATION)</td>
<td>555</td>
</tr>
<tr>
<td>INTERNATIONAL DISTILLERS AND VINTNERS</td>
<td>29260</td>
</tr>
<tr>
<td>ICI PLASTICS DIVISION</td>
<td>424</td>
</tr>
<tr>
<td>W.H. SMITH</td>
<td>400</td>
</tr>
<tr>
<td>MIDLESEX POLYTECHNIC</td>
<td>226</td>
</tr>
<tr>
<td>STOCK EXCHANGE</td>
<td>520</td>
</tr>
<tr>
<td>UCKIS</td>
<td>541</td>
</tr>
</tbody>
</table>
Some information providers produce educational material. Here is an illustration of the first frame in a series of information pages on Labour Law.
The unit on top of this TV set is converting the standard domestic TV receiver into a teletext receiver.
Prestel Present

- Information on the economy
- Commercial and business information
- Technical and scientific information
- Planning a holiday
- Entertainment guide
- Travel guide
- Planning a career
- Advice and leisure in the home

Prestel Future

- Electronic shopping
- Electronic mail
- Electronic polling
- Communication for the deaf
- Personal computers
- Education in the home

We have seen some of the wide variety of applications to which the Prestel interactive information retrieval system may be used by scientific, business and home users. We have listed only a small number of the present areas of application.

Some of the future possibilities for Prestel are shown above. In many ways the future applications of Prestel are limitless.
The last section of this presentation deals with yet another type of teletext system. This third type differs from the previous ones in that it is based upon a combination of different types of communication channel. Consequently systems of this type are often referred to as 'mixed media systems'. Two examples will be briefly described: The PLATO system which was developed at the University of Illinois in the USA and the CYCLOPS system that is currently being developed by the Open University in the United Kingdom. Both systems are extremely valuable for education and training both in colleges and in industry.
The 'PLATO' system was developed in the University of Illinois, USA in order to utilise a computer as a powerful teaching tool within education and training.

It is thus a computer-based learning system that is capable of providing sophisticated learning strategies over a wide range of subject disciplines including science, technology and the arts.
The user communicates with the PLATO computer by means of a special PLATO terminal. The terminal is connected to the computer via a telephone network. Information transmission from the computer to the terminal is via a high capacity broadband TV channel which thus permits large amounts of information to be rapidly transferred to the user's terminal.
'PLATO' is a good example of a mixed-media computer-based learning system. It can be integrated into the teacher's collection of other learning resources such as:

- Videotapes
- Workbooks
- Lectures
- Audio tapes
- Oral discussion groups
- and so on, to produce highly sophisticated multimedia teaching strategies.

Teachers using such a wide range of educational resources are thus able to select the teaching medium most appropriate to the teaching of a particular part of the course.
Another computer based teaching system similar to PLATO is being developed by the Open University in the UK. It is called CYCLOPS.

The basic CYCLOPS system allows the student to play audio-visual tapes. Compared with 'PLATO' this system is relatively low cost.
This picture shows a user of the CYCLOPS system interacting with an image on the screen by means of a light pen. Notice that the CYCLOPS CONVERTER is standing on the top of the TV set alongside a conventional telephone. The telephone may be used to connect the system to an external computer via a telephone network.
The addition of a light pen provides an audio-visual communication system. The communications may be either student to student or teacher to several students.
Adding a simple stereo cassette recorder to the basic CYCLOPS system allows a teacher or student to make simple tapes.
The addition of a digitizing tablet makes the system more convenient for the teacher when recording tapes or sending messages visually via the CYCLOPS system.
The diagram below illustrates the wide capability of the CYCLOPS system being developed by the Open University in the UK. It shows a complete recording and central communications centre with TV camera input. Such a system would enable the teacher to make very sophisticated tapes with graphics stored on the computer.
The user of the CYCLOPS system can also point to a set of characters with the light pen. This provides a cheap visual display unit. The addition of a keyboard provides a more convenient visual display unit. Because the screen is constructed from a conventional TV set it is not touch sensitive and a light pen must be used. However, this terminal is compatible with and may be used to receive ORACLE and CEEFAX messages because the system uses a standard TV set.
In the CYCLOPS system graphic material is produced either via computer programs or by digitizing conventional photographs and diagrams.

For the purpose of graphic display, the screen of the TV set may be thought of as an array of 256 x 256 dots. The physical separation between these dots determines the quality of the picture that can be produced.

The illustration below shows a comparison between an original diagram (shown on the left) with that which has been produced by the CYCLOPS system (shown on the right) via the digitization process.
Here is a picture of an author's studio. The author is the person responsible for preparing material to be transmitted to the user of the system. The studio contains facilities for producing audio recordings, taking photographs and converting them into computer readable format and a terminal which the author uses to communicate with the computer. Preparing the material for transmission is quite a tedious task. However, once it is prepared it can be easily modified and updated by means of the computer system.
In this computer assisted tape-slide presentation we have looked at the subject of communication between one human and another. We have seen how teletext systems in conjunction with computer systems can help solve some of the problems of communication over geographically large areas and how such systems may be employed for the future benefit of society on a local, national and world-wide basis.
TELETEXT SYSTEMS -

Reading List


(14) Clarke, K.E., Home Communications III : Videotext Standards, ibid., 33-35.


SECTION 3

THE AUDIO TAPE SCRIPT
INTRODUCTION

This section describes the script which was used to prepare the audiotape used in the CAL experiments. It contains the narrative that accompanies each of the slides presented in the teaching programme. A draft script - see Figure 6.12, Chapter 6 in Volume I - was initially prepared to produce a trial audiotape. Before the actual recording was made the slides were shown on the Caramate and the notes on the script rehearsed to get the feel and pace of the intended presentation. These trial runs necessitated changing the sequence of some slides, making additional slides and adding or deleting words to emphasise points that had been overlooked.

When the words and pictures flowed smoothly, the trial tape was ready for adding pulse signals which automatically synchronised the slides with the sound recording. The method of adding pulses was described in detail in Volume I (Section 6.223).

The trial audiotape was made on a standard tape cassette recorder which unfortunately contained extraneous noises due to the limitations of the equipment. For example, the noise caused by pressing and releasing the 'PAUSE' button was particularly distracting. Subsequently the script was recorded on a reel-to-reel tape recorder in a properly equipped sound studio at Newcastle upon Tyne Polytechnic. From the master tape produced several copies were made in cassette form.

The audiotape script was also used as the basis for preparing the information in the 'GUIDEBOOK TO TELETEXT SYSTEMS' described in Section 2 of this volume.
TELETEXT SYSTEMS

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April 1980
This is the sound track of the tape-slide presentation "TELETEXT SYSTEMS".

During their everyday lives people need to communicate one with another. The purpose of communication is to disseminate information. This information may be used as a means of solving problems or for carrying on conventional social discourse. Alternatively, it may be used purely for its entertainment value.

People communicate in a variety of ways: through talking and listening, through writing, by drawing pictures and diagrams and, of course, by reading. Very often listening to a radio broadcast or watching a television programme can constitute very effective methods of receiving information.

Communication is the transmission of information from a source to a destination via a suitable communication channel. It can be a one-way or two-way process.

A newspaper, a book or a television programme each represent a unidirectional or one-way means of communication. The author of a newspaper article or of a book has little opportunity of interacting with the recipient of the information that he dispatches.

Two-way or bi-directional communication involves information flow between the originator of the information and its recipient. For example, a conventional conversation between two people, either face to face or via a telephone system, are examples of bi-directional communication. In this mode of communication the media used to convey information need not be the same. The third example shown in the slide, mode C, illustrates how two different channels may be used to carry information between those involved in the communication process.
This program is concerned with the use of teletext systems for the communication of stored information to potential users of that information. There are several types of teletext system. They differ only in the ways in which the user is able to select his information and upon the types of communication channel used to convey the information.

We shall consider three broad types of system:

- One way communication using a TV channel,
- Two way communication using a telephone network,
- Two way communication using a combination of a TV channel and a telephone network.

Let's look first of all at the use of a TV channel.

In addition to its role as an entertainment medium, the television system can be used to broadcast signals of a more informative nature. When used in this way the TV is said to form part of a Broadcast Teletext System.

Information that is stored within a computer system is relayed via a broadcasting station and a TV channel to possible users of that information. These users may be located in a school or a college, in their own home or in the business or industrial sector.

The computer system is able to store large quantities of information on a variety of topics and subject areas. Users of the system are provided with a simple push-button device attached to their TV set to enable them to select the information that they wish to have displayed.

Here is a simplified diagram of the keypad used to select information and control the mode of operation of the television set. It can operate in two modes: TV or TELETEXT. The mode to be used is selected by pressing the appropriate button - green or red. Pressing the red button sets the system in its teletext mode of operation.

When in teletext mode the user can press the numbered buttons 1, 2, 3, ... up to 9, in any sequence, to form a numeric code consisting of several digits. This code is used to specify which information the user wishes to have displayed on the television screen. For example, by using the code 102 he is able to obtain recent home news. By means of the code 115 he can look at an up-to-date weather map. Of course, there are many other options.

Within the United Kingdom there are two broadcasting authorities: the British Broadcasting Corporation, or BBC, and the Independent Broadcasting Authority, or IBA. Each of these operate a broadcast
teletext system. They are called CEEFAX and ORACLE, respectively. The user is not restricted to one or the other. He may use either system to obtain the information that he needs.

The information that is stored within the computer system and which is relayed to the TV screen is organised as a collection of pages.

SLIDE 9

The viewer examines one page of information at a time on his TV screen. Each page of information contains a page number to enable it to be uniquely identified. It also carries a date which the user may use in order to determine the age of the information that the page carries.

The computer system contains many hundreds of pages of information. In the slide, only 500 are shown. These pages are broadcast one after the other in strict sequence: page 1, page 2, page 3, ... and so on. When all the pages have been transmitted the cycle repeats itself. Page 1 is re-transmitted, then page 2, and so on. Between broadcast cycles, certain people are allowed to change the information contained on the pages. In this way the information that is broadcast can always be kept up to date.

The information contained on the pages may be lines of textual data or simple pictorial information. Here are some examples of pages of information.

SLIDE 10

Here is an example of a page of information from the ORACLE teletext system. As can be seen on the top left hand side, this is page 106. This page is a type of advertisement page that is used to inform users about some of the types of information that they can obtain from the system. For example, the weather report, recent scientific or sporting achievements, where to buy food at economic prices and even guides to the theatre and cinema.

SLIDE 11

Here is another example of a teletext page. This time the example is taken from the BBC's CEEFAX system. Notice that once again the page number and date are displayed at the top of the page. This is CEEFAX page 100. It is an index page. An index page is used to provide a summary of the categories of information that the system contains and shows the page numbers to be used in order to access any particular category.

Notice that the entry in the top right hand side reads:

WEATHER MAP -------------------------115

If the page number 115 was to be entered on the keypad, the following page of information would be displayed.
This is CEEFAX page 115. It displays a simple picture that represents a weather map of the United Kingdom. We see here how simple graphic techniques can be used to disseminate information in a way that is easy for its user to assimilate and understand.

Notice how colour has been used to show areas having different temperature ranges. Yellow has been used for temperatures below 20 deg. C., while red indicates areas having temperatures above this limit. Colour can be used to good advantage in order to emphasise particular facets of the information being displayed.

Teletext systems permit about seven different colours to be used: red, yellow, white, green, blue, magenta and cyan. These are essentially the basic colours that are used in a conventional domestic colour television receiver.

The following slide shows how these different colours may be utilised within a page of information.

This page of information uses several different colours. The main heading of the page is in blue while the other information lines are given in yellow. A special line of information which is slightly different from its neighbours is shown in white in order to draw the user's attention to it.

Instructions aimed at telling the user what to do next are given in green. These indicate which numeric codes have to be used in order to obtain information on the topics listed. For example, if the user presses the button labelled "1" on his keypad he could obtain further information on Citroen cars, while pressing button number "3" would give him a page of information describing the Datsun range.

Notice how this page uses two different character fonts - large blue characters for the heading and yellow or green small characters for the other lines. It also uses underlining to produce an appealing effect.

Here are some further examples illustrating the way in which the available graphic symbols can be used to construct interesting and attractive page formats.

Notice that in this example the characters are all "square-edged". This phenomenon arises as a result of the fact that the large characters used here are each built up from a combination of small coloured rectangles. This can be seen in the following diagram.
SLIDE 16

This illustration shows a highly magnified view of the alphanumerical characters and graphic symbols as they might appear on the screen of the TV receiver. The lower portion of the slide shows how large characters may be constructed from suitable combinations of appropriately coloured rectangles.

Notice how the TV screen is composed of a large number of horizontal scanning lines. It can be seen that each teletext row consists of many horizontal TV lines.

SLIDE 17

A normal television set is built to receive a picture constructed from 625 lines. Not all of these are actually used to carry the picture that the viewer sees. Some of them are used to carry engineer's test signals. Others are used for the teletext data upon which the teletext systems such as CEEFAX and ORACLE depend. A few of the lines that the viewer does not normally see are used to encode the digital information broadcast by the teletext system.

The information contained in the signals that are broadcast is represented as a pattern of binary electrical pulses.

SLIDE 18

The signal contains information to enable the TV receiver to synchronise itself with the incoming signal; in addition to the 40 display characters that constitute a teletext row of information, there is also time, page number and control information contained within the signal. Notice how each of the display characters requires 8 binary digits for its representation.

SLIDE 18.5 (Now turn to the computer screen)

SLIDE 19

Simple electronic circuits built into the television set can be used to extract the signals when it is operating in teletext mode.

These circuits extract the data signals from the vision signals and also determine which page of information the viewer wishes to have displayed. The required page of information is extracted from all the incoming pages, stored within the TV receiver and then displayed on the screen.

SLIDE 20

Let's now summarise the details of the pages of information that are transmitted by the ORACLE and CEEFAX systems.

Each system has available a total of 800 different pages. Where it is not possible to put all the information relating to a given topic onto one page, from 1 to 5 continuation pages may be used.
Pages may contain up to six different colours.

A row is composed of a combination of 40 characters. One page of information contains 24 rows.

When pages of information are broadcast the row transmission rate is 200 rows per second.

IBA has more pages than the BBC but the more important pages (such as news headlines) are re-broadcast more frequently than less important pages (such as horoscopes). This gives the more important pages a faster retrieval time comparable to that of CEEFAX.

Because pages are re-broadcast in a cyclic nature, it is easy to change their contents and thereby make the information that they contain always be up to date. This process is called editing.

**SLIDE 21**

The information pages are edited by means of a typewriter keyboard connected to a computer. The person performing the editing types in the new information and the computer alters the appropriate page within the teletext information store. When the altered page next comes to be broadcast, the new, or updated information, gets transmitted to the users of the system.

**SLIDE 22**

Here is an example of an editing terminal. This example shows an ORACLE editorial suite.

**SLIDE 22.5 (Now turn to the computer screen)**

**SLIDE 23**

The CEEFAX editing system works in exactly the same way. The news editors type in new facts or information which replaces that which is out of date. In this way, users of the system always receive accurate up to date information.

**SLIDE 24**

The second category of teletext system with which this program deals depends upon the use of conventional telephone networks to transmit the information from one point to another. Generally, such systems are referred to as VIEWDATA or VIDEOTEX systems.

Within the United Kingdom the service offered by the British Post Office is called PRESTEL. A similar service provided by the French telephone authorities is called ANTOIOPE. Most other countries, such as Germany, Canada and Japan also have similar viewdata systems.
In contrast to the broadcast teletext systems, viewdata is an interactive system since its users actually communicate with the computer that is used to store the information.

**SLIDE 25**

Viewdata systems consist of five essential components,

(a) the user terminal,
(b) a telephone,
(c) a telephone network,
(d) a computer system,
(e) the information provider's terminal.

The user's terminal consists of a domestic television set that has been converted to receive the special viewdata signals. It is connected to a telephone and then, via a telephone network, to a computer that stores information in a compact form. The computer is capable of storing over one million pages of information. The user selects the page of information he requires by means of a keypad similar to that used for the ORACLE or CEEFAX system.

The information provider's terminal is like a typewriter keyboard. It enables information to be inserted into the computer store and then, at a later stage, permits that information to be modified in various ways. The way in which information flows within the system is shown with green, red and blue arrows.

**SLIDE 26**

Here is an example of a domestic viewdata terminal. In the foreground the information user is using her keypad to select the information page she requires. The keyboard is about the same size as a pocket calculator and contains the numerals 0 through 9 plus two 'command' buttons. In the background the television is displaying PRESTEL page 152.

**SLIDE 27**

Here is another example of a user's terminal. This one is designed specially for the business user of the viewdata system. This user is displaying information page 5. Viewdata is able to provide a wide range of information services for the business user, for example,

- legal data,
- stock and share prices,
- accounting facilities,
- inventory services,
- etc.

**SLIDE 28**

Here is another diagram of the VIEWDATA system showing two of the telephone exchanges that form part of the telecommunications network which is fundamental to the successful operation of the system.
Information flows through the network at two different speeds. Transmission is at 1200 bits/sec. in receive mode and 75 bits/sec. in transmit mode from the user's terminal. Conventional asynchronous start/stop transmission is used. Each character that is transmitted is composed of 10 bits of which 7 are used for the data, 1 for parity and 1 each for start and stop marks.

SLIDE 28.5 (Now turn to the computer screen)

SLIDE 29

The VIEWDATA computer system is based upon the use of minicomputers in order to minimise the cost. Presently the GEC 4080 computer is being used because it offers good real time facilities and a high degree of protection against errors. The computers have between 256 kilobytes and 1 megabyte of store.

The computer programs are written in a programming language known as BABBAGE. Another language called CORAL is also used.

The information that is used by the PRESTEL system is stored on four 70 megabyte discs per computer. Later these are to be replaced by 300 megabyte discs.

SLIDE 30

The information provider's terminal is much more sophisticated than the user's terminal. In appearance it looks very much like a conventional typewriter keyboard. The information provider uses this terminal to enter information into the computer store and also edit it in order to remove errors and keep it up to date. Some of the keys on the keyboard are used to produce special graphic symbols and colouring effects on the pages of information that the information providers design.

SLIDE 31

There are over 150 information providers who have between them booked over 180,000 pages of space. Some of the leading information providers are organisations such as

FINTEL
Consumer's Association (WHICH)
SCITEL
Universities Central Council for Admissions

and so on.

Other organisations also offer information of various types. For example, W.H. Smith makes available details of the books and records that they offer for sale, while the Open University lists details of the various undergraduate courses that it provides.
SLIDE 32

A full list of information providers and the services available through PRESTEL is published in the printed user’s guide and directory. This is distributed free to users on a quarterly basis. The directory contains the page numbers which may be used to directly access information pages belonging to a particular information provider.

Some examples of the types of entries to be found in the guide are illustrated at the bottom of the slide. The left hand column gives the name of the information provider while the right hand column specifies the Prestel page number needed in order to retrieve the appropriate information provider's pages.

SLIDE 33

Here is an example of one of the SCITEL pages.

The actual page number (5410a) can be seen in the top right hand corner of the page. Usually each page of information also carries a figure which specifies how much it is going to cost the user in order to examine that page of information. Typical prices might be 0.5 to 15 pence per page examined. Some information providers do not charge the user for the information that they provide.

SLIDE 34

Some of the pages are index pages. These give the user an indication of the different categories of information that he may access. This slide shows an example of an index page.

The user specifies the category of information that he wishes to examine by means of his keypad. Pressing the number 1 on the keyboard would produce another page giving a list of 'sources of finance'. Selecting the number 3 would produce a page giving a list of 'financial consultants'.

If the value 5 had been selected via the keypad, the user would have been presented with some information about the 'stock market'.

SLIDE 35

Here is an example of another information page giving 'STOCK EXCHANGE' information about insurance companies.

Notice that at the bottom of the page on the left are instructions telling the user what he has to type on his keypad in order to return to the previous page that he was examining. Observe how the page is attractively laid out and how colour is used to emphasise particular facets of the information contained on a page.

SLIDE 36

Each page of information contains 24 lines each containing 40 characters. This permits a maximum of 960 characters per page. In addition to
textual information, special characters are available to enable the production of stimulating and enticing effects. This is a typical example of VIEWDATA graphic effects.

SLIDE 37

This is another example of VIEWDATA graphic effects.

SLIDE 38

There are almost 200,000 pages of information contained within the PRESTEL system. This information is organised logically in the form of a tree structure. Users of the system search for the information page they require by examining the main index or various sub-indexes. The user is thus guided from one level of the tree to the next via the index. It is possible to bypass the routing structure and go directly to the page required if the user knows the appropriate page number of the information he requires. Page numbers may be found from the Prestel User's Guide which is similar to a telephone directory.

SLIDE 39

Here is an example of the tree-structure relationship between the information pages of the PRESTEL system.

When the user is at level 500 he has four choices available to him; he may choose to examine information on any of the following topics:

- Parliament,
- Guide to Government Services,
- Central Film Library,
- Legal Aid and Advice.

If he selects page 5000, at the next lower level of the tree the user has seven choices available. Choosing page 50002 takes him one stage lower and gives him a selection of four pages. And so on.

SLIDE 40

We have seen some of the wide variety of applications to which the PRESTEL interactive information retrieval system may be used by scientific, business and home users. We have listed only a small number of its present areas of application.

Some of the future possibilities for PRESTEL include electronic shopping (the PRESTEL user will be able to compare prices and goods from his TV set), a form of electronic mail (users will be able to send messages to each other) and its use for conducting opinion polls. In addition, it will be able to provide a Personal Computer in the home and will have significant value as a tool for education within the home. In many ways the future applications of PRESTEL are limitless.
SLIDE 41

The last section of this presentation deals with yet another type of teletext system. This third type differs from the previous ones in that it is based upon a combination of different types of communication channel. Consequently, systems of this type are often referred to as 'Mixed Media Systems'. Two examples will be briefly described: the PLATO system which was developed at the University of Illinois in North America, and the CYCLOPS system that is currently being developed by the Open University in the United Kingdom. Both systems are extremely valuable for education and training both in colleges and in industry.

SLIDE 42

PLATO is an acronym for "Programmed Logic for Automatic Teaching Operation" and was originally designed in order to utilise a computer as a powerful teaching tool within education and training. PLATO is thus a computer based learning system that is capable of providing sophisticated learning strategies over a wide range of subject disciplines including science, technology and the arts.

The user communicates with the PLATO computer by means of a special PLATO terminal. The terminal is connected to the computer via a telephone network. Information transmission from the computer to the terminal is via a high capacity broad band television channel which thus permits large amounts of information to be rapidly transferred to the user's terminal.

SLIDE 42.5 (Now turn to the computer screen)

SLIDE 43

Here is an illustration of a PLATO terminal. It shows a conventional keyboard that enables its user to type in the answers to questions that the computer asks.

The screen of the visual display unit is a high resolution screen that enables high quality pictorial information to be displayed. In addition, the screen is touch sensitive so that the user can point to various objects that are displayed upon it; the computer is then able to recognise the object at which the user has pointed. This type of screen permits quite sophisticated types of computer-user dialogue to be constructed.

SLIDE 44

This slide shows a close-up view of the touch sensitive screen. It is displaying a picture showing some of the many dials that a pilot might encounter when flying a particular type of aeroplane. The computer is asking the trainee pilot to point to the altitude gauge. His response is checked and appropriate comments are given. PLATO can thus be used to provide much of the basic training for aeroplane pilots.
This slide shows the use of the touch sensitive screen for teaching people how to construct simple English language sentences. The student touches the words or pictures representing the words that are to be included in the sentence. If he makes a mistake, a word can be erased by pointing to the word ERASE. When he has finished constructing the sentence he can have it checked for correctness by pointing to the section of the screen containing the word NEXT. If at any time the student requires extra advice or tuition from the computer, he may obtain this additional assistance by pressing a special HELP button on the keyboard of the PLATO terminal.

In addition to words and computer generated graphics, the PLATO screen is able to display pictures taken from conventional slides. These three types of methods of displaying information may be combined to produce some extremely interesting effects.

This example shows a student answering some questions relating to a motor car driving test. The picture on the top half of the screen is produced from a slide of a motor-vehicle involved in a skid. The questions beneath the picture have been generated by the computer. The student points to the answer he thinks is correct. If he gives the correct answer the computer presents him with the next question. Alternatively, an incorrect reply will cause the computer to provide some extra coaching on this particular aspect of the course.

PLATO is an example of a computer based learning system. It can be integrated into the teacher's collection of other learning resources such as videotape, work-books, lectures, audio-tapes, oral discussion groups, and so on, to produce highly sophisticated multi-media teaching strategies. Teachers using such a wide range of educational resources are thus able to select the teaching medium most appropriate to the teaching of a particular part of the course.

Another teaching system similar to PLATO is being constructed by the Open University in the United Kingdom. It is called CYCLOPS and uses a conventional television set to display graphic and sonic information recorded on a conventional stereo cassette tape. Like PLATO, it can be used to produce quite sophisticated graphic effects. In addition, the user may interact with the TV screen via a light pen.

This picture shows a user of the system interacting with an image on the screen by means of a light pen. Notice that the CYCLOPS converter is standing on top of the television screen alongside a conventional telephone. The telephone may be used to connect the system to an external computer via a telephone network.
Graphic material is produced either via computer programs or by digitising conventional photographs and diagrams.

For the purpose of graphic display, the screen of the TV set may be thought of as an array of 256 x 256 dots. The physical separation between these dots determines the quality of the picture that can be produced. This slide shows a comparison between some original diagrams (shown on the left) with those that have been produced via the CYCLOPS system (shown on the right) using a digitisation process.

This slide shows how the system may be connected via a telephone and modem onto a telephone network and then to a remote computer facility. In this slide the user is again interacting with the screen of his TV set and at the same time receiving sonic information either from the telephone or from a cassette tape via the TV set.

Addition of a typewriter keyboard to the TV set (and modem) now produces a sophisticated terminal similar to that used in the PLATO terminal. However, because the screen is constructed from a conventional television set, it is not touch sensitive. Instead, a light pen must be used. However, because it incorporates a standard TV set, this terminal is compatible with, and may be used to receive ORACLE and CEEFAX messages.

This slide shows an author's studio. The author is the person responsible for preparing material to be transmitted to the user of the system. The studio contains facilities for producing audio recordings, taking photographs and converting them into computer readable format. It also contains a computer terminal which the author uses in order to communicate with the computer. Preparing the material for transmission is quite a tedious task. However, once it is prepared it can be easily modified and updated by means of the computer system.

In this tape-slide presentation we have looked at the subject of communication between one human and another. We have seen how teletext systems in conjunction with computer systems can help solve some of the problems of communication over geographically large areas and how such systems may be employed for the future education of society on a local, national or world-wide basis.
SECTION 4

COMPUTER FRAMES - QUESTIONS AND ANSWERS
INTRODUCTION

This section contains the questions, multiple choice answers and remedial text for the teaching programme. The numbers of the relevant 35mm slides are also shown against each of the twenty questions illustrated. The slides, questions and multiple choice answers are organised into seven instructional units. The organisation of these instructional units was previously outlined in Section 6.34 of Volume I.

Each of the twenty questions, multiple choice answers and accompanying remedial textual information necessitated the preparation of a Frame Layout Chart. These were used in the preparation of the microcomputer program. Each Layout Chart represented a frame of information on the microcomputer screen. The program statements to produce these frames comprised more than 60% of the computer software - see Section 1 of this volume.

For each question there were four possible answers. Question and reinforcement material was structured for the computer program in the manner illustrated in Figure 6.15, Volume I. Each of the twenty questions was used to determine if the learning objectives of the teaching programme had been achieved. The learning objectives are described on page 3 of the 'GUIDEBOOK TO TELETEXT SYSTEMS' - see Section 2 of this Volume.
Relevant 35mm Slide Nos.

Questions

1 - 4
1. What is the major disadvantage of some conventional methods of communication such as books, manuals and newspapers?

Multiple Choice Answers

A. Revision and distribution is costly.
B. The content and quality varies.
C. There is no interaction.
D. There is no guarantee of understanding.

The answer is 'C' - there is no interaction.

Books, manuals and newspapers are examples of one-way methods of communication. Their major disadvantage is that you cannot ask them a question, i.e. there is no interaction.

5 - 9
2. What are the names of the teletext systems which are broadcast by the British Broadcasting Corporation (BBC) and the Independent Broadcasting Authority (IBA) respectively?

Multiple Choice Answers

A. ORACLE
B. TV TEXT
C. DATEL
D. CEEFAX

The answers are 'D' and 'A'.

CEEFAX (SEE FACTS) is the name of the BBC systems with information being broadcast over BBC1 and BBC2.

The IBA's system is called ORACLE (Optional Reception Announcements by Coded Line Electronics).
<table>
<thead>
<tr>
<th>Questions</th>
<th>Multiple Choice Answers</th>
<th>Coursebook Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. Different types of teletext system are discussed in this programme. How many broad types of teletext system are there?</strong></td>
<td>A. TWO</td>
<td>The answer is 'B'.</td>
</tr>
<tr>
<td></td>
<td>B. THREE</td>
<td>Three broad types of teletext system are discussed in this programme. They are:</td>
</tr>
<tr>
<td></td>
<td>C. FOUR</td>
<td>- One-way communication using a TV channel;</td>
</tr>
<tr>
<td></td>
<td>D. FIVE</td>
<td>- Two-way communication using a telephone network; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Two-way communication using a combination of a TV channel and a telephone network.</td>
</tr>
<tr>
<td><strong>4. How does the user obtain access to the information broadcast by the CEEFAX and ORACLE systems?</strong></td>
<td>A. By dialling a special telephone number.</td>
<td>The answer is 'D'.</td>
</tr>
<tr>
<td></td>
<td>B. By selecting a BBC or ITV channel on the TV set.</td>
<td>The keypad is used to control the mode of operation of the TV set and select the required information by pressing numbered buttons.</td>
</tr>
<tr>
<td></td>
<td>C. By using a remote control channel selector.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. By using a keypad.</td>
<td></td>
</tr>
</tbody>
</table>
Questions

5. How is specific information on different subjects identified on a teletext system?

6. All broadcast teletext systems illustrate textual and graphic displays in a variety of colours. How many colours have you observed in the examples shown?

Multiple Choice Answers

A. By the use of different colours on the TV screen.
B. By the use of capital or lower case (small) letters on the screen.
C. By the use of page numbers.
D. By the use of graphic symbols.

A. FIVE
B. SIX
C. SEVEN
D. MORE THAN SEVEN

Coursebook Outline

The answer is 'C'.

The information that is stored within the teletext computer system and which is relayed to the TV screen is organised as a collection of pages. Each page of information contains a page number to enable it to be uniquely identified.

All teletext broadcast systems use the standard basic colours available in the commercial domestic colour television receiver. The colours are red, yellow, white, green, blue, magenta and cyan.
7. What is the main difference between the BBC CEEFAX system and the IBA ORACLE system?

A. They use different TV channels.
B. IBA programmes vary in different regions.
C. IBA is more concerned with advertising than the BBC.
D. The IBA ORACLE system has many more pages of information than the CEEFAX system.

The answer is 'D'.

The ORACLE system has about 800 pages compared with the CEEFAX system which has only 100.

The IBA rebroadcast the more important pages, such as news headlines more frequently than the less important pages, such as horoscopes. This gives the more important pages a faster retrieval time comparable to that of CEEFAX.

8. To display information on a teletext screen requires the transmission of patterns of binary electrical pulses. How many binary digits need to be transmitted to form each character on the screen?

A. 8
B. 24
C. 40
D. 100

The answer is 'A'.

Each character requires 8 binary digits. A row is composed of 40 characters and one page of information contains 24 rows.

When pages of information are broadcast the row transmission rate is 100 rows per second.
<table>
<thead>
<tr>
<th>Relevant 35mm Slide Nos.</th>
<th>Questions</th>
<th>Multiple Choice Answers</th>
<th>Coursebook Outline</th>
</tr>
</thead>
</table>
| 17 - 20                 | 9. How would you describe the appearance of the graphic characters seen on teletext screens? | A. Colourful  
B. Ugly  
C. Square edged  
D. Rounded | The answer is 'C', square edged.  
This phenomenon arises from the fact that graphics are built up from a combination of small coloured rectangles. |
| 21 - 23                 | 10. How is the information transmitted to teletext screens kept up to date? | A. By transmitting 'news' etc. flashes on the screen.  
B. By having direct lines to information providers, e.g. Reuters.  
C. By means of editing terminals connected to a computer.  
D. By recycling pages rapidly. | The answer is 'C'.  
The information pages are edited by means of a typewriter keyboard connected to a computer. The person performing the editing types in the new information and the computer alters the appropriate page within the teletext information store. When the altered page next comes to be broadcast, the new or updated information gets transmitted to the users of the system. |
### Questions

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<th>Multiple Choice Answers</th>
<th>Coursebook Outline</th>
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</table>
| 24 - 40    | 13. Which mode of data transmission is used to transmit data to PRESTEL users? | A. Simplex  
B. Synchronous  
C. Asynchronous  
D. Duplex | The correct answer is 'C', Asynchronous, start/stop transmission is used. Each character that is transmitted is composed of 10 bits of which 7 are used for the data, 1 for parity and 1 each for start and stop marks. |
| 24 - 40    | 14. The number of pages of information available to users of the PRESTEL system is considerably higher than the other broadcast teletext systems. Which of the following is correct? | A. More than 10,000 but less than 50,000  
B. More than 50,000 but less than 100,000  
C. 100,000 to 150,000  
D. Over 150,000 but less than 250,000 | Answer 'D' is correct. There are over 150 information providers who have between them booked over 180,000 pages of space. |
| 24 - 40    | 15. What is the name of a similar viewdata service provided by the Canadian telephone authority? | A. Videotex  
B. Antiope  
C. Teledon  
D. TV TEXT | The correct answer is 'C', TELEDON. Other countries developing teletext systems are France (Antiope), Germany (Bildschirmtext). Other countries such as Japan and Sweden are also developing systems. |
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<td>41 - 54</td>
<td>16. Which of the following are mixed-media systems?</td>
<td>A. CYCLOPS</td>
<td>The correct answers are 'A', CYCLOPS, and 'D', PLATO.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. ORACLE</td>
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<td></td>
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<td>C. TELEDON</td>
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<td></td>
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<td>D. PLATO</td>
<td></td>
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<tr>
<td>41 - 54</td>
<td>17. In which University is PLATO being developed?</td>
<td>A. University of Ohio</td>
<td>The correct answers is 'D', University of Illinois. PLATO is an acronym for Programmed Logic for Automatic Teaching Operation.</td>
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<td></td>
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<td>B. University of California</td>
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<td>C. The Open University</td>
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<td>D. University of Illinois</td>
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<tr>
<td>41 - 54</td>
<td>18. How can the screen of the CYCLOPS system be accessed?</td>
<td>A. By touch (with the finger)</td>
<td>The correct answers are 'B', 'C' and 'D'.</td>
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<td></td>
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<td>B. By keyboard</td>
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<td>C. By light pen</td>
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<td>D. By use of a digitising tablet</td>
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<tr>
<td>Questions</td>
<td>Multiple Choice Answers</td>
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<tr>
<td>19. In the mixed-media systems described, what is the name of the person</td>
<td>A. Information provider</td>
<td>The correct answer is 'C'. The author works in a studio which contains facilities for producing audio recordings, producing photographs and converting them to computer readable format and a computer terminal to transmit, modify and update the information.</td>
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<td>responsible for preparing material for transmission to the user?</td>
<td>B. Editor</td>
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<td></td>
<td>C. Author</td>
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<td>D. Teletext Controller</td>
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<td>20. Who are likely to be the users of teletext systems in the future?</td>
<td>A. Business organisations</td>
<td>The correct answer is 'D'. Business organisations will use it for example for information on the economy, share prices, technical and scientific information. Housewives will use it for electronic shopping (i.e. comparing prices over the TV screen), for entertainment and travel information. It use in education will eventually cover all subjects, provide career guidance and enable personal computing to be done in the home.</td>
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<td>B. Housewives</td>
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<td>C. Schools and Colleges</td>
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<td>D. All of the above</td>
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SECTION 5

THE SLIDE COLLECTION
INTRODUCTION

This section contains an Index to the Slidefile 'TELETEXT SYSTEMS' which gives the Slide Number, a brief description of the slide contents and cross references to pages in the Guidebook where original artwork used to produce the slides is illustrated.

As previously mentioned, certain colour slides (marked with an * in the Index) could not be reproduced in the Guidebook because of the limitation of the reprographic facilities available.

Some 66 slides used in the original experiments are included in the Slidefile.

A variety of films and photographic techniques were used by the author to produce the slides and these are described in detail in Volume I (Section 6.224) of this thesis.

The data collection and research for the production of the slides is also described in the above Chapter - see Section 6.33.

At the end of the section is a list of the various sources of information which the author used to produce the slides.
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SOURCES OF INFORMATION FOR THE PRODUCTION OF 35 MM SLIDES ON 'TELETEXT SYSTEMS'

1. IBA Engineering Information Service, Winchester; This is ORACLE, 1977.

2. CEEFAX Unit, British Broadcasting Corporation Television Centre, Wood Lane, London - Ceefax publicity material.


Slides boxed and shelved

with audio-visual material

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at ++ 1981 / YEA
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<td>CYCLOPS - Use of a Modem</td>
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<td>54</td>
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<td>55</td>
<td>Trailer: 'THE END'</td>
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* Indicates a colour slide not reproduced in the Guidebook
SECTION 6

PRE-TEST AND POST-TEST MATERIALS.
INTRODUCTION

The initial experiments that were conducted had two major objectives:

(1) to investigate the problems involved in setting up a multi-media communication facility, and

(2) assessing the views of its users with respect to its overall acceptability.

In addition, there is yet another very important factor that needs to be considered - the effectiveness of the system. The purpose of the pre-test and post-test materials described in this section is to assess the effectiveness of the methods employed in the multi-media CAL system. To this end it is important to know the answer to the question: How much does the student learn and retain as a result of interaction with these devices?

The strategy for pre-test and post-test questioning was described fully in Volume I (Section 6.61). The following pages present:

(1) brief descriptions of the 80 slides used with the Kodak Random Access Slide Projector (RASP), and

(2) the multiple choice questions devised for each slide in the teaching programme.

Entering any number within the range 1-80 on the keyboard of the Commodore PET caused the carousel of the RASP to index to the slide number selected and project the slide on a back projection screen. Simultaneously the multiple choice questions relating to the particular slide appeared on the microcomputer screen.

The software was developed to select ten slides in a random manner. Although the experiment was demonstrated to several educational technologists, unfortunately time did not permit the RASP to be fully evaluated.
TELETEXT SYSTEMS

Pre/Post-Test Questions
for use with computer-assisted random access
slide projector
### TELETEXT SYSTEMS - PRE-TEST / POST-TEST

<table>
<thead>
<tr>
<th>Slide</th>
<th>Question</th>
<th>Multiple Choice Answer</th>
</tr>
</thead>
</table>
| 1. Viewdata Keypad | This device is used with teletext systems. What is it called? | A. Remote control device  
B. Channel Selector  
C. Keypad  
D. Page Selector |
| 2. ORACLE | This is the name of one of the broadcast teletext systems. Do you know the name of the broadcasting authority? | A. The British Broadcasting Authority (BBC)  
B. The Independent Broadcasting Authority (IBA)  
C. The Post Office  
D. The Canadian Broadcasting Authority |
| 3. Flow of Information in a Viewdata system | This diagram shows the flow of information in a teletext system. Can you identify the system? | A. PLATO  
B. CEEFAX  
C. ORACLE  
D. PRESTEL |
| 4. A page of Open University information | Here is some information on the Open University. What is the maximum number of rows of information that can be obtained on a teletext page? | A. 20  
B. 24  
C. 40  
D. 80 |
| 5. CYCLOPS - An Audio-visual System | Do you know who developed this teletext system? | A. BBC  
B. Open University  
C. University of Illinois  
D. IBA |
| 6. 'WHICH' Breakfast | The information on this teletext page is displayed in a number of colours. How many colours can be used by broadcast teletext systems? | A. Five  
B. Six  
C. Seven  
D. More than seven |
| 7. Viewdata 'Holiday Planning' | This page of teletext information does not use all the teletext colours available. How many colours could be used? | A. Five  
B. Six  
C. Seven  
D. More than seven |
| 8. PLATO screen displaying aircraft instrument panel | This type of teletext screen can be used to train airline pilots. What is this system called? | A. CYCLOPS  
B. PLATO  
C. SOCRATES  
D. TICCIT |
9. Girl using Prestel system
   Do you know the name of the device this girl is using?
   A. Cordless channel selector
   B. A data transmitter
   C. A keypad
   D. A teletext coder

10. Insurance Companies quoted on the Stock Exchange
    Can you tell from the page number on the screen who controls this system?
    A. The BBC
    B. The Post Office
    C. The Independent Broadcasting Authority
    D. The Open University

11. Flow Diagram of Viewdata System
    This diagram shows the flow of information through a British viewdata system. Can you identify the system?
    A. CEEFAX
    B. ORACLE
    C. PRESTEL
    D. CYCLOPS

12. ORACLE
    How would you describe this broadcast teletext system?
    A. One-way
    B. Interactive
    C. Multi-media
    D. None of the above

13. VIEWDATA - Jokes, Quizes and Games
    This picture was taken when this system was experimental. What is the name of the system now?
    A. ORACLE
    B. CEEFAX
    C. PRESTEL
    D. CYCLOPS

14. PLATO terminal
    This picture shows a terminal user using a keyboard, visual display unit, a slide projection unit and a workbook. Do you know the name of this system?
    A. CYCLOPS
    B. SOCRATES
    C. TICCIT
    D. PLATO

15. Types of Teletext Systems
    This picture illustrates the communication capabilities of three types of teletext system. Can you identify type 'A' teletext systems?
    A. PLATO
    B. ORACLE
    C. CEEFAX
    D. CYCLOPS

16. ORACLE data signals
    This slide shows how ORACLE data signals are transmitted. Do you know how many characters can be transmitted on one line of the screen?
    A. 20
    B. 40
    C. 80
    D. 120
<table>
<thead>
<tr>
<th>Slide</th>
<th>Question</th>
<th>Multiple Choice Answer</th>
</tr>
</thead>
</table>
| 17. CYCLOPS - Use of light Pen | This picture shows a user accessing the CYCLOPS system with a light pen. Who developed this system? | A. The Open University  
B. The University of Illinois  
C. The University of California  
D. The University of Ohio |
| 18. Simplified diagram of a teletext keypad | Here is a simplified diagram of a teletext keypad. What is the principal use of this device? | A. Selecting the appropriate TV channel  
B. Operating the TV set by remote control  
C. Selecting page numbers  
D. None of the above |
| 19. This slide shows some typical one-way methods of communicating | Which of the following teletext systems are one-way methods of communicating? | A. CYCLOPS  
B. CEEFAX  
C. ORACLE  
D. PRESTEL |
| 20 Schematic showing how ORACLE graphics and alphanumerics are formed | This diagram illustrates how ORACLE graphics and alphanumerics are formed. Which organisation is responsible for operating this teletext system? | A. The Post Office  
B. The Open University  
C. The BBC  
D. The Independent Broadcasting Authority |
| 21 VIEWDATA - Hobbies and Pastimes | Here is a screen of information when the system was called VIEWDATA. What is this British system called now? | A. CYCLOPS  
B. CEEFAX  
C. PRESTEL  
D. ORACLE |
| 22 PO Experiment - Course topics | Here is some detailed information on course topics. From the information given on the slide can you say which system is presenting the information? | A. CYCLOPS  
B. PRESTEL  
C. CEEFAX  
D. PLATO |
| 23 CYCLOPS - Audio-Cassette/ Light Pen | Here is a diagram of a system which provides sound as well as visual communication. What is this system called? | A. PLATO  
B. CYCLOPS  
C. ORACLE  
D. PRESTEL |
| 24 VIEWDATABASE - Typical tree structure | Here is a diagram of a viewdatabase showing a typical tree structure. Can you tell from the diagram which teletext system would use this structure? | A. Ceefax  
B. Presetel  
C. Oracle  
D. Cyclops |
25. Map showing the television companies in the IBA Network
Which teletext system is this organisation responsible for?
A. PRESTEL
B. CEEFAX
C. CYCLOPS
D. ORACLE

26. VIEWDATA (Title in Graphics)
Who invented the world’s first viewdata system?
A. The British Post Office
B. The Open University
C. The French Telephone Authority
D. The Canadian Telephone Authority

27. Teletext Colour Circles
How many of these colours can be used to produce graphic characters on teletext screens?
A. Four
B. Five
C. Six
D. Seven

28. Girl using the Prestel system at home
This girl is using a British Viewdata system. How many pages are currently available?
A. 100
B. 800
C. 10,000
D. Over 150,000

29. ORACLE - Data Transmission
This is a UK Broadcast teletext system. Who controls this particular system?
A. The Post Office
B. The British Broadcasting Authority
C. The Independent Broadcasting Authority
D. The Open University

30. Businessman using a viewdata system
This businessman is using a British viewdata system. Who is responsible for keeping this type of information up-to-date?
A. Reuters
B. The BBC
C. The Open University
D. A registered information provider

31. Open University Course details
Here is a teletext screen with a lot of information on it. Do you know how many rows of information can be transmitted per second?
A. 24
B. 40
C. 80
D. 100

32. W.H. SMITH Index Page
W.H. Smith is a typical information provider. How many information providers are there at present involved in the British viewdata system?
A. Less than 100
B. 100 - 200
C. Under 300
D. Over 300
<table>
<thead>
<tr>
<th>Slide</th>
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<th>Multiple Choice Answer</th>
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</thead>
</table>
| 33. Home user viewing typical page of information | This is a typical 'page' of information. How many pages of information has the CEEFAX system? | A. 100  
B. 800  
C. 500  
D. 1000 |
| 34. 'TELETEXT SYSTEMS' (Title Slide) | How many broad types of teletext systems are there? | A. Two  
B. Three  
C. Four  
D. More than four |
| 35. PLATO - English Language construction | Here is a screen showing how simple English Language sentences may be constructed. Do you know the name of this system? | A. CYCLOPS  
B. PLATO  
C. PRESTEL  
D. ORACLE |
| 36. CEEFAX Index Page | This is the name of one of the broadcast teletext systems. Who is responsible for this system? | A. The BBC  
B. The IBA  
C. The Post Office  
D. The Open University |
| 37. CYCLOPS - Digitized pictures | On the left of this picture is some original artwork. On the right the artwork has been reproduced by a computer. Do you know the name of this system? | A. SOCRATES  
B. TICCIT  
C. CYCLOPS  
D. PLATO |
| 38. Computer Storage of teletext pages | This diagram shows how the computer stores pages of information. How many pages of information does the CEEFAX system use? | A. 100  
B. 800  
C. Over 1000  
D. Over 100,000 |
| 39. United Kingdom Broadcasting Authorities | This slide shows the systems operated by the United Kingdom Broadcasting Authorities. What is the major difference between the two systems? | A. One system has more pages than the other  
B. One system is more expensive  
C. One system uses Post Office equipment  
D. One system is interactive |
| 40. Present and Future Prestel Applications | This illustration shows some present and future applications of the Prestel system. How would you describe such a system from the communication point of view? | A. One-way  
B. Interactive  
C. Two-way  
D. Multi-media |
<table>
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<tr>
<th>Slide</th>
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</thead>
</table>
| 41. Business Viewdata | Here is a picture showing the wide range of financial and other services available to the business user. Can you identify this teletext system? | A. CYCLOPS  
B. PRESTEL  
C. PLATO  
D. ORACLE |
| 42. SCITEL Services | Here is a teletext screen showing information available to scientists. Who originates such information and keeps it updated? | A. The BBC  
B. The Science Research Council  
C. A registered information provider  
D. The Open University |
| 43. Teletext Systems - Aiding Human Communications by Computer | This diagram illustrates that the aim of teletext systems is to aid human communications by computer. Which of the following will benefit from using teletext systems? | A. Housewives  
B. Business organisations  
C. Educational establishments  
D. All of the above |
| 44. PRESTEL Business user with telephone terminal | This British teletext system is linked to a telephone network. What is it called? | A. EXTEL  
B. DATEL  
C. PRESTEL  
D. FINTEL |
| 45. PLATO - Close-up of pilot using touch sensitive screen | The information on this screen can be accessed by touch. What is this system called? | A. CYCLOPS  
B. PLATO  
C. CEEFAX  
D. SOCRATES |
| 46. Girl using PRESTEL system | Which of the following are necessary to provide the basic components of a viewdata system? | A. A specially adapted television set  
B. A telephone line  
C. A computer  
D. A telex system |
| 47. A typical computer installation | The British viewdata system uses computer systems to store the information. Do you know the manufacturers of these systems? | A. IBM  
B. ICL  
C. GEC  
D. CDC |
| 48. PO Experiment - Course topics | British teletext systems have standardised on the number of characters that can be displayed on a screen. Do you know the number? | A. 480  
B. 960  
C. 1440  
D. 240 |
<table>
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<tr>
<th>Slide</th>
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</thead>
</table>
| 49. ORACLE - Advertisement Page                                      | This is a typical advertisement page of the ORACLE teletext system. How many pages has this system? | A. 100  
B. 500  
C. 800  
D. Over 1000 |
| 50. Viewdata Connections                                             | Do you know the mode of data transmission used by the British viewdata system? | A. Simplex  
B. Duplex  
C. Synchronous  
D. Asynchronous |
| 51. Business viewdata terminal                                       | This business user is accessing an interactive computer based information system. What is the name of the system? | A. VIEWDATA  
B. CYCLOPS  
C. ORACLE  
D. PRESTEL |
| 52. Financial Services                                               | Here is a slide showing the range of financial services available. Who provides the basic information? | A. The Financial Times  
B. The Economist  
C. Various Information Providers  
D. The Post Office Datel Service |
| 53. CEEFAX page                                                      | Here is a page of information from the CEEFAX teletext system. What is the major difference between this system and the ORACLE broadcast teletext system? | A. It has more pages  
B. It has fewer pages  
C. It is an interactive system  
D. It is a multi-media system |
| 54. Post Office Information Providers Terminal                       | Only one type of UK teletext system uses this terminal. Which system is it? | A. PRESTEL  
B. CEEFAX  
C. CYCLOPS  
D. ORACLE |
| 55. PLATO terminal Airline pilot touching screen                    | Which organisation developed this system which can be used for training airline pilots? | A. Open University  
B. University of California  
C. University of Illinois  
D. University of Ohio |
| 56. PLATO Driving Test                                               | This picture shows someone undertaking a motor car driving test by means of a terminal connected to a computer. What is the name of this system? | A. ORACLE  
B. TICCIT  
C. PLATO  
D. CYCLOPS |
<table>
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<th>Slide</th>
<th>Question</th>
<th>Multiple Choice Answer</th>
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</thead>
</table>
| 57. CYCLOPS Range of Devices | Do you know who developed the system shown on this slide? | A. University of Illinois  
B. The Post Office  
C. The Open University  
D. University of California |
| 58. PRESTEL Information Providers | Here is a partial list of information providers. It is taken from the British viewdata system. Where would you obtain a full list? | A. In the Yellow Pages  
B. In the Prestel Directory  
C. In the BBC Yearbook  
D. In the Telex directory |
| 59. Information Provider's Terminal | Here is a picture of a special type of terminal used with British teletext systems. Who uses this type of terminal? | A. Teletext controllers  
B. News editors  
C. Information providers  
D. Business users |
| 60. Teletext Screen Organisation and Data Signals | This slide shows how information is transmitted on broadcast teletext systems. How many rows of information can be obtained on a teletext screen? | A. 20  
B. 24  
C. 40  
D. 100 |
| 61. VIEWDATA (Title in Graphics) | Which of the following countries in addition to the UK are developing teletext systems? | A. Norway  
B. Canada  
C. Japan  
D. All of the above |
| 62. VIEWDATA Title Slide | A system formerly known by this name now has a new name. What is it? | A. ORACLE  
B. CEEFAX  
C. PRESTEL  
D. CYCLOPS |
| 63. Viewdata Connections | This slide shows various items of equipment that make up a teletext system. What are the names of the programming languages used in viewdata systems? | A. COBOL  
B. BABBAGE  
C. CORAL  
D. BASIC |
| 64. Methods of Communication | Here are some commonly used methods of receiving information. What is their major disadvantage? | A. They are too costly  
B. They are not up to date  
C. There is no guarantee of understanding  
D. They are not interactive |
<table>
<thead>
<tr>
<th>Slide</th>
<th>Question</th>
<th>Multiple Choice Answer</th>
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</thead>
</table>
| 65. PLATO Flow diagram | How would you describe this type of system? | A. One-way communication  
B. Multi-media communication  
C. Wide band television communication  
D. Two-way communication |
| 66. ORACLE Editorial Terminal | This girl is using a special terminal. What is its purpose? | A. Providing business information  
B. Editing information  
C. Producing graphic characters  
D. Controlling the colours displayed on the teletext screen |
| 67. Business Users Terminal | Here is a picture of a special type of terminal used in teletext systems. Who uses this type of terminal? | A. Teletext editors  
B. Information providers  
C. Business users  
D. Teletext controllers |
| 68. SCITEL Information Page | Here is a page of specialised information. Who provides this type of information in teletext systems? | A. The Post Office  
B. The Independent Broadcasting Authority  
C. Business organisations  
D. The British Broadcasting Corporation |
| 69. Author's Studio | This is a picture of a specially equipped studio. Who uses this equipment? | A. News Editors  
B. Transmission controllers  
C. Authors  
D. Company information providers |
| 70. PLATO (Pilot Training) | This picture shows an airline pilot touching a terminal screen. What is the name of this system? | A. SOCRATES  
B. TICCIT  
C. PLATO  
D. ORACLE |
| 71. Graphic Characters (Boat Data) | This screen of teletext information shows some graphic characters. How many colours can be used with graphic characters? | A. Five  
B. Six  
C. Seven  
D. More than seven |
<table>
<thead>
<tr>
<th>Slide</th>
<th>Question</th>
<th>Multiple Choice Answer</th>
</tr>
</thead>
</table>
| 72.  | CEEFAX Weather Map | This is CEEFAX page 115. It is an up-to-date weather map of the UK. How would you obtain this information? | A. By dialling the BBC weather centre  
B. By use of a keypad  
C. Wait for it to appear automatically  
D. Dial 115 on a special telephone |
| 73.  | ORACLE Title Slide | Why have these graphic characters a 'square edged' appearance? | A. Because this is the style used by the ORACLE teletext system  
B. Because of the type of terminal used  
C. Because they are formed by combinations of small rectangles  
D. Rounded characters look old fashioned |
| 74.  | ORACLE data organisation | This diagram shows how teletext data is organised. How many binary digits are needed to form a single character on the screen? | A. 8  
B. 16  
C. 32  
D. 40 |
| 75.  | Communication (Source to Destination) | Communication is the transmission of information from a source to a destination via a suitable communication channel. It can be a one-way or two-way process. Which of the following are one-way teletext systems? | A. CEEFAX  
B. ORACLE  
C. PRESTEL  
D. CYCLOPS |
| 76.  | Types of Teletext System | Which of the following types of teletext system uses the communication devices illustrated in mode 'C' of this picture? | A. CEEFAX  
B. PRESTEL  
C. CYCLOPS  
D. PLATO |
| 77.  | Broadcast Teletext | What are the names of the teletext systems in the UK that use only a TV channel? | A. PLATO  
B. CYCLOPS  
C. ORACLE  
D. CEEFAX |
| 78.  | VIEWDATA | A viewdata system is being developed in Germany. Do you know its name? | A. Wagnertext  
B. Videotex  
C. Bildschirmtext  
D. Deutchtext |
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<tr>
<th>Slide</th>
<th>Question</th>
<th>Multiple Choice Answer</th>
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<tbody>
<tr>
<td>79. VIEWDATA - Mesh inter-connection at international level</td>
<td>In the future teletext systems will be interconnected internationally. What are the names of the systems which will connect Canada and France respectively?</td>
<td>A. Antiope B. Telidon C. Videotex D. Captains</td>
</tr>
<tr>
<td>80. CYCLOPS - showing modem and keyboard</td>
<td>This system can send information over a telephone line via a modem. What is this system called?</td>
<td>A. PRESTEL B. CYCLOPS C. PLATO D. SOCRATES</td>
</tr>
</tbody>
</table>