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Some experiments in man-machine interaction relevant to computer assisted learning

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

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CONTENTS

PREFACE

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=0
140 PRINT"/CD5R5/COURSE: TELETEXT SYSTEMS"
150 PRINT"/R5/***********************"
160 PRINT"/D3R6/ENTER YOUR NAME:"
170 PRINT"/D1R6/ENTER COURSE CODE:"
180 PRINT"/D3R3/PLUG ME IN..."
190 PRINT"/D1R3/SWITCH ON TAPE SLIDE EQUIPMENT...."
200 PRINT"/D1R3/TYPE 'GO' WHEN YOU'RE READY TO START"
210 PRINT"/D1R3/CONTACT YOUR TUTOR (PHILIP G. BARKER)"
220 PRINT "/R3/ ...... IF YOU HAVE ANY PROBLEMS"
230 PRINT"/HD8R25/"
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"/D1R20/TELETEXT SYSTEMS"
300 PRINT"/R20/****************"
310 PRINT"/R3/THREE TYPES OF SYSTEM WILL BE DESCRIBED"
320 PRINT"/D1R4/(A)   CEEFAX & ORACLE"
330 PRINT"/D1R4/(B)   VIEWDATA"
340 PRINT"/D1R4/(C)   PLATO & CYCLOPS"
350 PRINT"/D2/FIRST WE'LL LOOK AT THE MEANING OF THE TERM COMMUNICATION"
360 PRINT"/D3/TYPE 'GO' WHEN YOU ARE READY TO PROCEED"
370 INPUT"/D2R2/>"; GO$
380 PRINT "/CD3/NAME: "+A$
390 PRINT "/D1/COURSE CODE: "+B$
400 PRINT "/D2R3/PRESS ADVANCE ON THE CARAMATE"
410 PRINT "/D2R3/PRESS PLAY ON THE CARAMATE"
420 PRINT "/D2R3/WATCH THE SLIDES ..."
430 PRINT "/D2R3/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 640,1010,2330,3310,3790,4140,5390
610 IF NS=NF THEN GOSUB 8050 :GOTO 120
620 GOSUB 7500
630 GOTO 490
640 REM QUESTION SET 1  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?"
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700 PRINT "/R2/CHOOSE ONE OF THE FOLLOWING:"
710 PRINT "/D1/(A) REVISION AND DISTRIBUTION IS COSTLY"
720 PRINT "/D1/(B) THE CONTENT AND QUALITY VARIES"
730 PRINT "/D1/(C) NO INTERACTION IS POSSIBLE"
740 PRINT "/D1/(D) WE HAVE NO GUARANTEE OF UNDERSTANDING"
750 PRINT "/D1/TYPE THE LETTER THAT CORRESPONDS TO YOUR ANSWER"
760 INPUT ">> ":A$ : PRINT "/CHD3/"
770 IF IS A$="C" THEN 830
780 IF A$="A" OR A$="B" OR A$="D" THEN 870
790 PRINT "INVALID ANSWER" ; KI(K)=KI(K)+1
800 PRINT "/D3R3/TRY AGAIN/D3/"
810 PRINT "VALID ANSWERS ARE A,B,C OR D"
820 GOSUB 6960 : GOTO 670
830 PRINT "CORRECT - THE ANSWER IS C" : F2=1
840 PRINT "/D1R2/BECAUSE THERE IS NO INTERACTION"
850 PRINT "/D3R2/VERY GOOD/D2/NOW LET'S REVISE THIS TOPIC"
860 GOSUB 6960 : GOTO 910
870 PRINT "YOU ARE INCORRECT!!" : F2=0
880 PRINT "/D2/THE CORRECT ANSWER WAS C"
890 PRINT "/D2/LET'S CHECK THROUGH IT"
900 GOSUB 6960
910 PRINT "/CHD3/"
920 PRINT "BOOKS, MANUALS AND NEWSPAPERS ARE "
930 PRINT "EXAMPLES OF ONE-WAY METHODS OF"
940 PRINT "COMMUNICATION,"
950 PRINT "/D2/THEIR MAJOR DISADVANTAGE IS THAT YOU"
960 PRINT "CANNOT ASK THEM A QUESTION,"
970 PRINT "/D1R2/THAT IS,/R3/THERE IS NO INTERACTION"
980 GOSUB 7630
990 GOSUB 7120
1000 RETURN
1010 REM QUESTION SET2  222222222222222
1020 GOSUB 7570
1030 PRINT "/CHD3/WHAT ARE THE NAMES OF THE TELETEXT"
1040 PRINT "SYSTEMS WHICH ARE BROADCAST BY THE"
1050 PRINT "BRITISH BROADCASTING CORPORATION (BBC)"
1060 PRINT "AND THE INDEPENDENT BROADCASTING"
1070 PRINT "AUTHORITY (IBA) RESPECTIVELY?"
1080 PRINT "/D2/CHOOSE TWO OF THE FOLLOWING:"
1090 PRINT"/D2/"
1100 PRINT "/R3/A:   ORACLE"
1110 PRINT "/R3/B:   TV TEXT"
1120 PRINT "/R3/C:   DATEL"
1130 PRINT "/R/D:   CEEFAX"
1140 PRINT "/D2/TYPE THE TWO LETTERS THAT CORRESPOND TO YOUR ANSWERS:"
1150 INPUT ">> "; A$
1160 IF LEN(A$)=1 THEN 1460
1170 IF LEN(A$)>2 THEN 1510
1180 IF A$="DA" THEN 1350
1190 IF A$="AD" THEN 1270
1200 C1$=LEFT$(A$,1)
1210 C2$=RIGHT$(A$,1)
1220 V1=ASC(C1$) : V2=ASC(C2$)
1230 IF V1=65 OR V1>68 OR V2=65 OR V2>68 THEN GOTO 1300
1240 PRINT "/CHD4R3/INCORRECT" : F2=0
1250 PRINT "/D4R3/THE CORRECT ANSWER IS DA"
1260 GOSUB 6960 : GOTO 1370
1270 PRINT "/CHD3R3/YOU ARE ALMOST RIGHT" : F2=1
1280 PRINT "/D2R3/THE ANSWER IS DA NOT AD"
1290 GPSUB 6960 : GOTO 1360
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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 GPSUB 6960 : REM WAIT 5 SECS
1340 GOTO 1030
1350 PRINT "/CHD3R3/YOU ARE CORRECT" : F2=1
1360 GOSUB 6960 : REM WAIT 5 SECS
1370 PRINT "/CHD4/NOW LET'S REVIEW THIS QUESTION"
1380 PRINT "/D2/CEEFAX IS THE NAME OF THE BBC SYSTEMS"
1390 PRINT "THAT ARE BROADCAST OVER BBC1 AND BBC2."
1400 PRINT "/D2/THE WORD 'CEEFAX' IS DERIVED FROM THE EXPRESSION:"
1410 PRINT "/D1R7RV/  SEE FACTS  /RO/"
1420 PRINT "/D2/THE IBA'S SYSTEM IS CALLED 'ORACLE' "
1430 PRINT "WHICH THIS STANDS FOR:"
1440 PRINT "/D1R1RV/OPTICAL RECEPTION OF ANNOUNCEMENTS "
1450 PRINT "/D1RV/    BY CODED LINE ELECTRONICS"
              : GOSUB 7630 : GOSUB 7120 : GOTO 1550
1460 PRINT "/CHD3R3/INVALID ANSWER"
1470 PRINT "/D6R3/YOU MUST SELECT TWO LETTERS"
1480 PRINT "/D7R3/TRY AGAIN"
1490 KI(K)=KI(K)+1
1500 GOSUB 6960 : GOTO 1030
1510 PRINT "/CHD3R3/INVALID ANSWER"
1520 PRINT "/D6R3/YOUR ANSWER IS TOO LONG"
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/TYPE 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 KI(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 "/D1R2/1. ONE-WAY COMMUNICATION USING"
1840 PRINT "/R5/A TV CHANNEL,"
1850 PRINT "/D1R2/2. TWO-WAY COMMUNICATION USING"
1860 PRINT "/R5/A TELEPHONE NETWORK,"
1870 PRINT "/D1R2/3. TWO-WAY COMMUNICATION USING"
1880 PRINT "/R5/A COMBINATION OF A TV CHANNEL"
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1890 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 "/D1R3/A: BY DIALLING A SPECIAL TELEPHONE"
1980 PRINT "/R6/NUMBER,"
1990 PRINT "/D1R3/B: BY SELECTING A BBC OR ITV"
2000 PRINT "/R6/CHANNEL ON THE TV SET"
2010 PRINT "/D1R3/C: BY USING A REMOTE CONTROL"
2020 PRINT "/R6/CHANNEL SELECTOR"
2030 PRINT "/D1R3/D: BY MEANS OF A KEYPAD."
2040 PRINT "/D2R1/TYPE THE LETTER THAT CORRESPONDS"
2050 PRINT "/R1/TO YOUR ANSWER:"
2060 INPUT "/D1R7/>> ";A$
2070 IF A$="D" THEN 2150
2080 IF A$="A" OR A$="B" OR A$="C" THEN 2180
2090 KI(K)=KI(K)+1
2100 PRINT "/CHD3/INVALID ANSWER"
2110 PRINT "/D3/PLEASE CHOOSE FROM THE FOOLOWING:"
2120 PRINT "/D2/     A,B,C OR D"
2130 PRINT "TRY THIS QUESTION AGAIN"
2140 GOSUB 6960 : GOTO 1940
2150 PRINT "/CHD3R3/WELL DONE" : F2=1
2160 PRINT "/D2R3/YOU ARE PERFECTLY CORRECT"
2170 GOTO 2200
2180 PRINT "/CHD3R3/SORRY - YOU'RE WRONG!" : F2=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 "/D2R1/TO DO THIS THE USER PRESSES THE"
2250 PRINT "/R1/APPROPRIATE NUMBERED KEYS ON THE"
2260 PRINT "/R1/HAND HELD KEYPAD."
2270 PRINT "/D2R1/FOR EXAMPLE:"
2280 PRINT "/D1R2RV/THE CODE 102 SELECTS 'HOME NEWS'   /RO/"
2290 PRINT "/D1R2RV/THE CODE 106 GIVES 'FARM NEWS'     /RO/"
2300 PRINT "/D1R2RV/THE CODE 115 PROVIDES A WEATHER MAP/RO/"
2310 GOSUB 7120 : GOSUB 7630
2320 RETURN
2330 REM QUESTION SET 3 333333333333333333333333333333333333333
2340 GOSUB 7570
2350 PRINT"/CHD3R3/HOW IS SPECIFIC INFORMATION"
2360 PRINT"/R3/ON DIFFERENT SUBJECTS IDENTIFIED"
2370 PRINT"/R3/IN A TELETEXT SYSTEM?"
2380 PRINT"/D2R5/A: USING DIFFERENT COLOURS"
2390 PRINT"/R8/ON THE TV SCREEN"
2400 PRINT"/D1R5/B: USING CAPITAL OR LOWER"
2410 PRINT"/R8/CASE(SMALL) LETTERS ON"
2420 PRINT"/R8/THE SCREEN"
2430 PRINT"/D1R5/C: USING PAGE NUMBERS"
2440 PRINT"/D1R5/D: USING GRAPHIC SYMBOLS"
2450 GOSUB 7060
2460 IF A$="C" THEN 2530
2470 IF A$="A" OR A$="B" OR A$="D" THEN 2580
2480 PRINT"/CHD3/INVALID RESPONSE" : KI(K)=KI(K)+1
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2490 PRINT"/D3/PLEASE CHOOSE FROM THE FOLLOWING:"
2500 PRINT"/D1/   A,B,C OR D"
2510 PRINT"/D2/TRY THIS QUESTION AGAIN"
2520 GOSUB 6960 : GOTO 2350
2530 PRINT"/CHD3/WELL DONE "+NAME$ : F2=1
2540 PRINT"/D3/THE ANSWER IS C
2550 PRINT"/D1R3/- BY THE USE OF PAGE NUMBERS"
2560 GOSUB 6960
2570 GOTO 2600
2580 PRINT"/CHD3/NO - YOU ARE WRONG" : F2=0
2590 GOTO 2540
2600 PRINT"/CHD3/LET'S REVIEW THIS TOPIC"
2610 PRINT"BEFORE WE PROCEED"
2620 GOSUB 6960
2630 PRINT"/CHD7R3/THE INFORMATION THAT IS STORED"
2640 PRINT"/R3/WITHIN THE TELETEXT COMPUTER"
2650 PRINT"/R3/AND WHICH IS RELAYED TO THE TV"
2660 PRINT"/R3/SCREEN IS ORGANISED AS"
2670 PRINT"/R3/A COLLECTION OF PAGES,"
2680 PRINT"/D1R3/THE VIEWER EXAMINES ONE PAGE"
2690 PRINT"/R3/OF INFORMATION AT A TIME ON HIS"
2700 PRINT"/R3/TV SCREEN."
2710 PRINT"/D1R3/EACH PAGE OF INFORMATION CONTAINS"
2720 PRINT"/R3/A PAGE NUMBER TO ENABLE IT TO"
2730 PRINT"/R3/BE UNIQUELY IDENTIFIED,"
2740 GOSUB 7120 : GOSUB 7630
2750 REM ******* QUESTION 6 *******
2760 GOSUB 7570
2770 PRINT "/CHD1R3/ALL BROADCAST TELETEXT SYSTEMS"
2780 PRINT"/R3/ILLUSTRATE TEXTUAL AND GRAPHIC"
2790 PRINT"/R3/DISPLAYS IN A VARIETY OF COLOURS"
2800 PRINT"/R3/HOW MANY COLOURS HAVE YOU OBSERVED"
2810 PRINT"/R3/IN THE EXAMPLES SHOWN?"
2820 PRINT"/D2R9/A: FIVE"
2830 PRINT"/D2R9/B: SIX"
2840 PRINT"/D2R9/C: SEVEN"
2850 PRINT"/D2R9/D: MORE THAN SEVEN"
2860 GOSUB 7060
2870 C$="C":W1$="A":W2$="B":W3$="D"
2880 GOSUB 7230
2890 IF F1=1 THEN 2770
2900 PRINT"/HCD7R3/ALL TELETEXT BROADCAST SYSTEMS"
2910 PRINT"/R3/USE THE STANDARD BASIC COLOURS"
2920 PRINT"   AVAILABLE IN THE CONVENTIONAL"
2930 PRINT"/R3/DOMESTIC COLOUR TELEVISION"
2940 PRINT"/R3/RECEIVER"
2950 PRINT"/D2R3/THE COLOURS ARE RED, YELLOW"
2960 PRINT"   WHITE, GREEN, BLUE,MAGENTA AND"
2970 PRINT"/R3/CYAN"
2980 GOSUB 7120 : GOSUB 7630
2990 GOSUB 7570
3000 PRINT"/HCD1R5/WHAT IS THE /RV/MAJOR/RO/ DIFFERENCE"
3010 PRINT"/R5/BETWEEN THE BBC CEEFAX SYSTEM"
3020 PRINT"/R5/AND THE IBA ORACLE SYSTEM?"
3030 PRINT"/D2R5/A: THEY USE DIFFERENT"
3040 PRINT"/R8/TV CHANNELS"
3050 PRINT"/D1R5/B: IBA PROGRAMMES VARY"
3060 PRINT"/R8/IN DIFFERENT REGIONS"
3070 PRINT"/D1R5/C: IBA IS MORE CONCERNED"
3080 PRINT"/R8/WITH ADVERTISING THAN"
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3090 PRINT"/R8/THE BBC"
3100 PRINT"/D1R5/D: THE IBA ORACLE SYSTEM"
3110 PRINT"/R8/HAS MORE PAGES OF"
3120 PRINT"/R8/INFORMATION THAN CEEFAX"
3130 GOSUB 7060
3140 C$="D": W1$="A": W2$="B": W3$="C"
3150 GOSUB 7230
3160 IF F1=1 THEN 3000
3170 PRINT"/HCD7R3/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"/D1R3/THE IBA BROADCAST THE MORE"
3220 PRINT"/R3/IMPORTANT PAGES SUCH AS NEWS"
3230 PRINT"/R3/HEADLINES MORE FREWUENTLY THAN"
3240 PRINT"/R3/THE LESS OMPORTANT PAGES, SUCH"
3250 PRINT"/R3/AS HOROSCOPES"
3260 PRINT"/D1R3/THIS GIVES THE MORE IMPORTANT"
3270 PRINT"/R3/PAGES A FASTER RETRIEVAL TIME"
3280 PRINT"/R3/COMPARABLE TO THAT OF CEEFAX"
3290 GOSUB 7120 : GOSUB 7630
3300 RETURN
3310 REM QUESTION 8 ******************
3320 GOSUB 7570
3330 PRINT"/HCD3R6/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"/D1R6/HOW MANY BINARY DIGITS NEED"
3380 PRINT"/R6/TO BE TRANSMITTED TO FORM"
3390 PRINT"/R6/EACH CHARACTER ON THE SCREEN?"
3400 PRINT"/D2R11/A: 8"
3410 PRINT"/D1R11/B: 24"
3420 PRINT"/D1R11/C: 40"
3430 PRINT"/D1R11/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"/HCD7R3/EACH CHARACTER REQUIRES 8"
3490 PRINT"/R3/BINARY DIGITS"
3500 PRINT"/D1R3/A ROW IS COMPOSED OF 40 "
3510 PRINT"/R3/CHARACTERS AND ONE PAGE OF"
3520 PRINT"/R3/INFORMATION CONTAINS 24 ROWS"
3530 PRINT"/D1R3/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"/HCD1R6/HOW WOULD YOU DESCRIBE THE"
3600 PRINT"/D1R6/APPEARANCE OF THE GRAPHIC"
3610 PRINT"/D1R6/CHARACTERS SEEN ON TELETEXT"
3620 PRINT"/D1R6/SCREENS?"
3630 PRINT"/D2R9/A: COLOURFUL"
3640 PRINT"/D1R9/B: UGLY"
3650 PRINT"/D1R9/C: SQUARE-EDGED"
3660 PRINT"/D1R9/D: ROUNDED"
3670 GOSUB 7060
3680 C$="C": W1$="A": W2$="B": W3$="D"
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3690 GOSUB 7230
3700 IF F1=1 THEN 3590
3710 PRINT"/HCD7R4/TELETEXT 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., FLASHES 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. REUTERS"
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 C$="C": W1$="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"/D1R3/THE PERSON PERFORMING THE EDITING"
4030 PRINT"/R3/TYPES IN THE NEW INFORMATION AND"
4040 PRINT"/R3/THE COMPUTER ALTERS THE CORRECT"
4050 PRINT"/R3/PAGE WITHIN THE TELETEXT"
4060 PRINT"/R3/INFORMATION STORE"
4070 PRINT"/D1R3/WHEN THE ALTERED NEXT COMES"
4080 PRINT"/R3/TO BE BROADCAST, THE NEW OR"
4090 PRINT"/R3/UPDATED INFORMATION GETS"
4100 PRINT"/R3/TRANSMITTED TO THE USERS OF THE"
4110 PRINT"/R3/SYSTEM"
4120 GOSUB 7120 : GOSUB 7630
4130 RETURN
4140 REM QUESTION 11 *************
4150 GOSUB 7570
4160 PRINT"/HCD1R7/THE POST OFFICE ALSO"
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: DATEL"
4230 GOSUB 7060
4240 C$="B": W1$="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/"
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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"/R10/TRANSMISSION IS USED"
4670 PRINT"/R10/TO TRANSMIT DATA TO"
4680 PRINT"/R10/PRESTEL USERS?"
4690 PRINT"/D2R11/A: SIMPLEX"
4700 PRINT"/D1R11/B: SYHCHRONOUS"
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 F1=1 THEN 4650
4770 PRINT"/CHD7R3/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
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4890 PRINT"/HCD1R4/THE NUMBER OF PAGES OF"
4900 PRINT"/R4/INFORMATION AVAILABLEON"
4910 PRINT"/R4/PRESTEL IS CONSIDERABLY"
4920 PRINT"/R4/HIGHER THAN THE OTHER"
4930 PRINT"/R4/BROADCAST TELETEXT SYSTEMS"
4940 PRINT"/D1R4/WHICH OF THE FOLLOWING"
4950 PRINT"/R4/IS CORRECT?"
4960 PRINT"/D2R4/A: 10,000 BUT LESS THAN 50,000"
4970 PRINT"/D1R4/B: 50,000 BUT LESS THAN 100,000"
4980 PRINT"/D1R4/C: 100,000 BUT LESS THAN 150,000"
4990 PRINT"/D1R4/D: 150,000 BUT LESS THAN 250,000"
5000 GOSUB 7060
5010 C$="D": W1$="A": W2$="B": W3$="C"
5020 GOSUB 7230
5030 IF F1=1 THEN 4890
5040 PRINT"/HCD7R3/THERE ARE OVER 150 INFORMATION"
5050 PRINT"/R3/PROVIDERS INVOLVED WITH THE"
5060 PRINT"/R3/PRESTEL SYSTEM WHO HAVE BETWEEN"
5070 PRINT"/R3/THEM BOOKED OVER 180,000 PAGES"
5080 PRINT"/R3/OF SPACE (OCT. 1979)"
5090 PRINT"/D1R3/IT IS ENVISAGED THAT THE SYSTEM"
5100 PRINT"/R3/WILL EVENTUALLY SUPPORT OVER"
5110 PRINT"/R3/ONE MILLION PAGES OF INFORMATION"
5120 GOSUB 7120 : GOSUB 7630
5130 REM QUESTION 15 **************
5140 GOSUB 7570
5150 PRINT"/HCD1R8/WHAT IS THE NAME OF A"
5160 PRINT"/R8/SIMILAR VIEWDATA SERVICE"
5170 PRINT"/R8/PROVIDED BY THE CANADIAN"
5180 PRINT"/R8/TELEPHONE AUTHORITY?"
5190 PRINT"/D2R10/A: VIDEOTEX"
5200 PRINT"/D1R10/B: ANTIOPE"
5210 PRINT"/D1R10/C: TELEDON"
5220 PRINT"/D1R10/D: TV TEXT"
5230 GOSUB 7060
5240 C$="C": W1$="A": W2$="B": W3$="D"
5250 GOSUB 7230
5260 IF F1=1 THEN 5150
5270 PRINT"/CHD5R3/THE NAME OF THE VIEWDATA SERVICE"
5280 PRINT"/R3/PROVIDED BY THE CANADIAN TELEPHONE"
5290 PRINT"/R3/AUTHORITY IS /RV/TELEDON/RO/"
5300 PRINT"/D1R3/OTHER COUNTRIES DEVELOPING"
5310 PRINT"/R3/TELETEXT SYSTEMS ARE:"
5320 PRINT"/D1R10/- FRANCE (ANTIOPE)"
5330 PRINT"/D1R10/- GERMANY (BILDSCHIRMTEXT)"
5340 PRINT"/D1R3/OTHER COUNTRIES SUCH AS JAPAN"
5350 PRINT"/R3/AND SWEDEN ARE ALSO DEVELOPING"
5360 PRINT"/R3/SYSTEMS"
5370 GOSUB 7120 : GOSUB 7630
5380 RETURN
5390 REM QUESTION 16 ****************
5400 GOSUB 7570
5410 PRINT"/CHD4R8/WHICH OF THE FOLLOWING"
5420 PRINT"/R8/ARE MIXED MEDIA SYSTEMS?"
5430 PRINT"/D2R11/A: CYCLOPS"
5440 PRINT"/D1R11/B: ORACLE"
5450 PRINT"/D1R11/C: TELEDON"
5460 PRINT"/D1R11/D: PLATO"
5470 PRINT"/D2/TYPE THE TWO LETTERS THAT CORRESPOND TO YOUR ANSWERS:"
5480 INPUT"/D1R10/>>";A$
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5490 IF LEN(A$)=1 THEN 5700
5500 IF LEN(A$)>2 THEN 5740
5510 IF A$="AD" OR A$="DA" THEN 5650
5520 C1$=LEFT$(A$,1)
5530 C2$=RIGHT$(A$,1)
5540 V1=ASC(C1$) : V2=ASC(C2$)
5550 IF V1<65 OR V1 >68 OR V2<65 OR V2>68 THEN 5600
5560 PRINT"/CHD4/CORRECT" : F2=0
5570 PRINT"/D2/THE CORRECT ANSWER IS 'AD' OR 'DA'"
5580 PRINT"/D2/NEVER MIND!"
5590 GOSUB 6960: GOTO 5680
5600 PRINT"/CHD3/YOU ARE USING INVALID LETTERS"
5610 PRINT"/D1/ONLY THE LETTERS A,B,C OR D ARE ALLOWED"
5620 PRINT"/D2/HAVE ANOTHER GO"
5630 KI(K)=KI(K)+1
5640 GOSUB 6960: GOTO 5410
5650 PRINT"/CHD3/WELL DONE "+NAME$ : F2=1
5660 PRINT"/D1/YOU'VE GOT THE RIGHT ANSWER"
5670 GOTO 5590
5680 PRINT"/CHD3/LET'S REVIEW THIS TOPIC"
5690 GOSUB 6960: GOTO 5780
5700 PRINT"/CHD3/INVALID ANSWER"
5710 KI(K)=KI(K)+1
5720 PRINT"/D2/YOU MUST SELECT TWO LETTERS"
5730 PRINT"/D2/TRY AGAIN" : GOTO 5640
5740 PRINT"/CHD3/INVALID ANSWER"
5750 PRINT"/D1/YOU HAVE TYPED TOO MANY LETTERS"
5760 KI(K)=KI(K)+1
5770 GOTO 5640
5780 PRINT"/CHD8R6/A MIXED MEDIA SYSTEM USES"
5790 PRINT"/D1R6/OTHER MEDIA, E.G. SOUND AND"
5800 PRINT"/D1R6/PICTURES"
5810 PRINT"/D1R6RV/CYCLOPS/RO/ AND /RV/PLATO/RO/ ARE"
5820 PRINT"/D1R6/MIXED MEDIA SYSTEMS"
5830 GOSUB 7120 : GOSUB 7630
5840 REM QUESTION 17 ***************
5850 GOSUB 7570
5860 PRINT"/CHD5R6/IN WHICH UNIVERSITY IS"
5870 PRINT"/R6/PLATO BEING DEVELOPED?"
5880 PRINT"/D2R8/A: UNIVERSITY OF OHIO"
5890 PRINT"/D1R8/B: UNIVERSITY OF CALIFORNIA"
5900 PRINT"/D1R8/C: OPEN UNIVERSITY"
5910 PRINT"/D1R8/D: UNIVERSITY OF ILLINOIS"
5920 GOSUB 7060
5930 C$="D": W1$="A": W2$="B": W3$="C"
5940 GOSUB 7230
5950 IF F1=1 THEN 5860
5960 PRINT"/CHD7RV/PLATO/RO/ IS BEING DEVELOPED"
5970 PRINT"/D1R4/BY THE UNIVERSITY OF ILLINOIS"
5980 PRINT"/D2R4RV/PLATO/RO/ IS AN ACRONYM FOR"
5990 PRINT"/D1R4RV/P/RO/ROGRAMMED /RV/L/RO/OGIC FOR /RV/A/RO/UTOMATIC"
6000 PRINT"/D1R4RV/T/RO/EACHING /RV/O/RO/PERATIONS"
6010 GOSUB 7120 : GOSUB 7630
6020 REM QUESTION 18 **************
6030 GOSUB 7570
6040 PRINT"/CHD4R8/HOW CAN THE SCREEN OF"
6050 PRINT"/D1R8/THE CYCLOPS SYSTEM BE"
6060 PRINT"/D1R8/ACCESSED?"
6070 PRINT"/D2R11/A: BY TOUCH (WITH THE"
6080 PRINT"/R19/FINGER)"
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6090 PRINT"/D1R11/B: BY KEYBOARD"
6100 PRINT"/D1R11/C: BY LIGHT PEN"
6110 PRINT"/D1R11/D: BY USE OF A DIGITISING"
6120 PRINT"/R19/TABLET"
6130 PRINT"/D2/TYPE THE LETTERS THAT CORRESPOND TO YOUR ANSWERS:"
6140 INPUT"/D1R11/>>";A$
6150 IF A$="DCB" OR A$="DBC" THEN 6230
6160 IF A$="BCD" OR A$="BCD" THEN 6230
6170 IF A$="CBD" OR A$="CDB" THEN 6230
6180 IF LEN(A$)<3 THEN 6250
6190 IF LEN(A$)>3 THEN 6280
6200 PRINT"/CHD3/SORRY - BUT THIS IS NOT CORRECT" : F2=0
6210 PRINT"/D3/THE CORRECT ANSWER IS BCD"
6220 GOSUB 6960: GOTO 6300
6230 PRINT"/CHD3/YES - YOU HAVE IT" : F2=1
6240 GOTO 6210
6250 PRINT"/CHD3/YOU HAVEN'T TYPED ENOUGH LETTERS"
6260 PRINT"/D2/HAVE ANOTHER TRY"
6270 GOSUB 6960: GOTO 6040
6280 PRINT"/CHD3/YOU HAVE TYPED TOO MANY LETTERS"
6290 GOTO 6260
6300 PRINT"/CHD7R6/THE SCREEN OF THE CYCLOPS"
6310 PRINT"/D1R6/SYSTEM CAN BE ACCESSED AS"
6320 PRINT"/D1R6/FOLLOWS:"
6330 PRINT"/D1R16/- BY KEYBOARD"
6340 PRINT"/D1R16/- BY LIGHT PEN"
6350 PRINT"/D1R16/- BY USE OF A"
6360 PRINT"/D1R16/DIGITISING TABLET"
6370 GOSUB 7120 : GOSUB 7630
6380 REM QUESTION 19 ***************
6390 GOSUB 7570
6400 PRINT"/CHD5R6/IN THE MIXED MEDIA SYSTEMS"
6410 PRINT"/R6/DESCRIBED, WHAT IS THE NAME"
6420 PRINT"/R6/OF THE PERSON RESPONSIBLE"
6430 PRINT"/R6/FOR PREPARING MATERIAL FOR"
6440 PRINT"/R6/TRANSMISSION TO THE USER?"
6450 PRINT"/D2R8/A: INFORMATION PROVIDER"
6460 PRINT"/D1R8/B: EDITOR"
6470 PRINT"/D1R8/C: AUTHOR"
6480 PRINT"/D1R8/D: TELETEXT CONTROLLER"
6490 GOSUB 7060
6500 C$="C": W1$="A": W2$="B": W3$="D"
6510 GOSUB 7230
6520 IF F1=1 THEN 6400
6530 PRINT"/CHD7R6/THE PERSON RESPONSIBLE FOR"
6540 PRINT"/R6/PREPARING MATERIAL FOR"
6550 PRINT"/R6/TRANSMISSION TO THE USER IS"
6560 PRINT"/R6/CALLED AN /RV/AUTHOR/RO/"
6570 PRINT"/D1R6/THE AUTHOR'S STUDIO CONTAINS"
6580 PRINT"/R6/FACILITIES FOR PRODUCING AUDIO"
6590 PRINT"/R6/RECORDINGS, PHOTOGRAPHS AND"
6600 PRINT"/R6/CONVERTING THEM TO COMPUTER"
6610 PRINT"/R6/READABLE FORMAT"
6620 PRINT"/D1R6/THERE IS ALSO A COMPUTER"
6630 PRINT"/R6/TERMINAL TO TRANSMIT, MODIFY"
6640 PRINT"/R6/AND UPDATE THE INFORMATION"
6650 GOSUB 7120 : GOSUB 7630
6660 REM QUESTION 20 ************
6670 GOSUB 7570
6680 PRINT"/CHD5R6/WHO ARE LIKELY TO BE USERS"
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6690 PRINT"/D1R6/OF TELETEXT SYSTEMS IN"
6700 PRINT"/D1R6/THE FUTURE?"
6710 PRINT"/D2R8/A: BUSINESS ORGANISATIONS"
6720 PRINT"/D1R8/B: HOUSEWIVES"
6730 PRINT"/D1R8/C: SCHOOLS AND COLLEGES"
6740 PRINT"/D1R8/D: ALL OF THE ABOVE
6750 GOSUB 7060
6760 C$="D": W1$="A": W2$="B": W2$="C"
6770 GOSUB 7230
6780 IF F1=1 THEN 6680
6790 PRINT"/CHD3R3/TELETEXT SYSTEMS WILL BE USED"
6800 PRINT"/R3/WIDELY IN SOCIETY IN THE FUTURE"
6810 PRINT"/D1R3/BUSINESS ORGANISATIONS FOR EXAMPLE"
6820 PRINT"/R3/WILL USE IT FOR INFORMATION ON"
6830 PRINT"/R3/THE ECONOMY, SHARE PRICES, TECHNICAL"
6840 PRINT"/R3/AND SCIENTIFIC INFORMATION"
6850 PRINT"/D1R3/HOUSEWIVES WILL USE IT FOR"
6860 PRINT"/R3/ELECTRONIC SHOPPING, I.E. COMPARING"
6870 PRINT"/R3/PRICES OVER THE TV SCREEN, FOR"
6880 PRINT"/R3/ENTERTAINMENT AND TRAVEL INFORMATION"
6890 PRINT"/D1R3/ITS USE IN EDUCATION WILL"
6900 PRINT"/R3/EVENTUALLY COVER ALL SUBJECTS,"
6910 PRINT"/R3/PROVIDE CAREER GUIDANCE AND ENABLE"
6920 PRINT"/R3/PERSONAL COMPUTING TO BE DONE"
6930 PRINT"/R3/IN THE HOME"
6940 GOSUB 7120 : GOSUB 7630
6950 RETURN
6960 REM WAIT FOR 5 SECONDS
6970 LIM5=TI+5*60
6980 IF TI<LIM5 THEN 6980
6990 RETURN
7000 REM *****************************
7010 REM WAIT FOR 10 SECONDS
7020 LIM10=TI+10*60
7030 IF TI<LIM THEN 7030
7040 RETURN
7050 REM *****************************
7060 REM GETANSWER FROM RESPONDENT
7070 PRINT "/D2R1/TYPE THE LETTER THAT CORRESPONDS"
7080 PRINT "/R1/TO YOUR ANSWER:"
7090 INPUT "/D1R16RV/>> /RO/";A$
7100 RETURN
7110 REM *****************************
7120 REM WAITGO - WAIT FOR GO MESSAGE
7130 PRINT"/D1R4RV/                              /RO/    "
7140 PRINT"/R4RV/ TYPE GO OR HELP WHEN YOU ARE /RO/"
7150 PRINT"/R4RV/ READY TO PROCEED:             "
7160 PRINT"/R4RV/                              /RO/"
7170 INPUT"/D1R12RV/>> /RO/";G$
7180 IF G$="HELP" OR G$="H" OR G$="GO" OR G$="G" THEN 7210
7190 GOSUB 7860
7200 GOTO 7130
7210 IF G$="HELP" OR G$="H" THEN GOSUB 7690
7220 RETURN
7230 REM CHECK ANSWER
7240 F1=0 : REM SET FLAG
7250 IF A$=C$ THEN 7330
7260 IF A$=W1$ OR A$=W2$ OR A$=W3$ THEN 7370
7270 KI(K)=KI(K)+1
7280 PRINT"/CHD3/INVALID ANSWER"
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7290 PRINT"/D3/PLEASE CHOOSE FROM THE FOLLOWING:"
7300 PRINT"/D2/   A,B,C OR D"
7310 PRINT"/D2/TRY THIS QUESTION AGAIN"
7320 GOSUB 6960 : F1=1    : RETURN
7330 PRINT"/CHD4/WELL DONE - YOU'RE RIGHT" : F2=1
7340 PRINT"/D3/THE ANSWER IS "+C$
7350 GOSUB 6960
7360 GOTO 7390
7370 PRINT"/CHD4/NO- YOU ARE INCORRECT" : F2=0
7380 GOTO 7340
7390 PRINT"/CHD3/BEFORE WE PROCEED"
7400 PRINT"/D1/LET'S CHECK THROUGH THE ANSWER"
7410 GOSUB 6960
7420 RETURN
7430 REM *************************
7440 REM LINK FRAME 1 **************
7450 PRINT"/CHD12R2/"
7460 PRINT "HERE IS A QUESTION ON WHAT YOU HAVE SEEN"
7470 GOSUB 6960
7480 RETURN
7490 REM *************************
7500 REM LINK FRAME 2 **************
7510 REM CLEAR THE SCREEN
7520 REM GO BACK TO SLIDES
7530 PRINT"/CHD12/"
7540 PRINT"NOW LET'S LOOK AT SOME MORE SLIDES"
7550 RETURN
7560 REM *************************
7570 REM MONITOR START OF QUESTION
7580 REM *************************
7590 K=K+1
7600 QS=TI
7610 KI(K)=0 : HR(I)=0
7620 RETURN
7630 REM MONITOR END OF QUESTION
7640 REM *********************
7650 AP$(K)=A$
7660 M(K)=F2 : QF=TI
7670 TA(K)=(QF-QS)/60
7680 RETURN
7690 REM THIS IS THE HELPER
7700 PRINT"/CHD7/IF YOU ARE HAVING DIFFICULTY"
7710 PRINT"WITH THIS QUESTION YOU WILL FIND"
7720 PRINT "SOME FURTHER READING MATERIAL IN THE"
7730 PRINT"/D2R4RV/                     /RO/"
7740 PRINT"/R4RV/ TELETEXT GUIDEBOOK /RO/"
7750 PRINT"    /RV/                   /RO/"
7760 PRINT "/D2/THAT IS LOCATED NEXT TO YOUR TERMINAL."
7770 PRINT "/D3/EXAMINE THE FOLLOWING PAGES:"
7780 PRINT "/D1R11RV/ "+PG$(K)+"  /RO/"
7790 INPUT"/D2R2/TYPE /RV/GO/RO/ TO PROCEED";G$
7800 HR(K)=1
7810 IF G$="GO" OR G$="G" THEN 7850
7820 PRINT "/CHD6/INVALID REPLY"
7830 PRINT "/D2R2RV/GO ASSUMED/RO/"
7840 GOSUB 6960
7850 RETURN
7860 PRINT"/U7/   "
7870 PRINT"/R4/                        "
7880 PRINT "/R4/INVALID REPLY       "
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7890 PRINT "/R4/VALID ANSWERS ARE:      "
7900 PRINT"/R4/        /RV/HELP/RO/
              , /RV/GO/RO/, /RV/H/RO/ AND /RV/G/RO/      "
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 PG$(I) : NEXT I
8000 DATA 9,"15, 16 AND 17",11,13,18
8010 DATA 23,29,27,24,30
8020 DATA 34,33,35,39,33
8030 DATA 44,45,"50 52 AND 54",56,57
8040 RETURN
8050 PRINT"/CD3/END OF PRESENTATION"
8060 PRINT "/D2/PRESS STOP ON THE CARAMATE"
8070 PRINT "/D2/PRESS REWIND ON THE CARAMATE"
8080 GOSUB 6960
8090 POKE 59471,5
8100 TF=TI
8110 CR=0 : KS=0
8120 TP=INT((TF-TS)/3600+0.5)
8130 FOR J=1 TO 20
8140 CR=CR+M(J)
8150 KS=KS+KI(J)
8160 TA(J)=INT(TA(J)+0.5)
8170 NEXT J
8180 PRINT"/CHD6/HERE ARE YOUR COURSE STATISTICS."
8190 INPUT"/D2/IS A PRINTER AVAILABLE";A$
8200 IF A$="YES" OR A$="NO" THEN 8220
8210 PRINT "/D2/INVALID REPLY":PRINT"PLEASE ANSWER YES OR NO"
          : GOSUB 6960 : GOTO 8180
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=1TO10:PRINT$1," ":NEXT J
8270 PRINT$1,"=============================================="
8280 PRINT$1,"NAME: ";NAME$
8290 PRINT$1,"COURSE CODE: ";B$
8300 PRINT$1,"TIME FOR PRESENTATION: ";TP;" 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 KEYINS MARK HELP  ANS"
8360 PRINT$1,"======== ==== ====== ==== ====  ==="
8370 FOR J=1 TO 20
8380 GOSUB 8500
8390 PRINT$1,J$;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$1, " "
8440 NEXT J
8450 CLOSE 1
8460 PRINT"/CHD6/PLEASE DETACH THE PRINTER LISTING"
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8470 PRINT"AND ATTACH IT TO YOUR QUESTIONNAIRE"
8480 INPUT"/D2R2/TYPE /RV/GO/RO/ TO PROCEED";G$
8490 GOTO 8900 : REM LAST FRAME
8500 J$=STR$(J)
8510 IF LEN(J$)=3 THEN 8530
8520 H$=" "+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 PRINT"ATTACHED TO THE EQUIPMENT YOU WILL"
8610 PRINT"HAVE TO COPY YOUR ANSWER PROFILE"
8620 PRINT"ONTO /RV/FORM A/RO/ OF YOUR QUESTIONNAIRE"
8630 INPUT"/D2/TYPE /RV/GO/RO/ TO PROCEED";G$
8640 PRINT"/CHD2/COPY THE FOLLOWING RESULTS TO /
              RV/FORM A/RO/   ON YOUR QUESTIONNAIRE"
8650 PRINT"=================================="
8660 PRINT"/D2/NAME: ";NAME$ : PRINT"/D1/COURSE CODE: ";B$
8670 PRINT "/D1/TIME FOR PRESENTATION: ";TP;" MINUTES"
8680 PRINT"/D1/NUMBER OF CORRECT ANSWERS: ";CR
8690 PRINT"/D1/NUMBER OF INCORRECT ANSWERS: ";20-CR
8700 PRINT"/D1/NUMBER OF INCORRECT KEY-INS: ";KS
8710 INPUT"/D3/TYPE /RV/GO/RO/ TO PROCEED";G$
8720 PRINT"/CHD4/HERE IS THE ANSWER PROFILE FOR THE"
8730 PRINT"QUESTIONS YOU HAVE ANSWERED:"
8740 PRINT"/D2/COPY THE RESULTS TO /RV/FORM A/RO/ "
8750 PRINT"OF THE QUESTIONNAIRE."
8760 INPUT "/D2/TYPE /RV/GO/RO/ TO PROCEED";G$
8770 FOR L2=1 TO 4
8780 PRINT"/CHD2R2/QUESTION TIME KEYINS MARK HELP ANSWERS"
8790 PRINT" ======= ==== ====== ==== ==== ======="
8200 PRINT "/D2/"
8810 FOR L1=1 TO 5
8820 J=(L2-1)*5+L1
8830 GOSUB 8500
8840 PRINT TAB(4);J$;TAB(11);TA(J);TAB(18);KI(J);TAB(24);M(J);TAB(29);HR(J);
8850 PRINT TAB(32):AP$(J)
8860 PRINT "   "
8870 NEXT L1
8880 INPUT"/D2/TYPE /RV/GO/RO/ TO PROCEED";G$
8890 NEXT L2
8900 REM LAST FRAME
8910 PRINT "/CHD4/THIS IS THE END OF THE DIALOGUE"
8920 PRINT"/D1/PLEASE FIND AN EMPTY TABLE"
8930 PRINT"AND COMPLETE YOUR QUESTIONNAIRE"
8940 PRINT"/D2/WHEN YOU HAVE COMPLETED IT"
8950 PRINT"PLEASE RETURN IT TO THE"
8960 PRINT"RESEARCH ASSISTANT CONDUCTING"
8970 PRINT"THE EXPERIMENT"
8980 PRINT"/D2R3/     /RV/THANKS FOR YOUR HELP""
8990 GOSUB 7010: GOSUB 7010
9000 RETURN
9010 REM PUT UP TITLE FRAME
9020 L1$=" "
9030 FOR I=1 TO 38:L1$=L1$+"/RVG191/":NEXT
9040 L2$=" /RVG191RO/"
9050 FOR I=1 TO 36:L2$=L2$+" ":NEXT
```

```
9060 L2$=L2$+"/RVG191/"
9070 M1$="/RVG191RO/  ":M2$="  /RVG191RO/"
9080 T1$="/RVG032032RO/   ":T2$=" /RV/ /RO/"
9090 E1$="/RV/ /RO/   ": E2$="/RV/ /RO/   ":E3$="/RV/  /RO/  "
9100 X1$="/RVG223RO/ /RVG169RO/ "
9110 X2$="/G223162169032/"
9120 X3$=" /RV/ /RO/   "
9130 X4$="/RVG169162RVG223RO/ "
9140 X5$="/G169032223032/"
9150 S1$="/RVG032ROG032184032/": S2$="/G185032RVG032ROG032"
9160 Y1$="/RVG032ROG032032RVG032ROG032/"
        : Y2$="/RVG032ROG185185RVG032ROG032/"
9170 Y3$=" /RVG161ROG161/  "
9180 M3$="/RVG032223ROG032RVG169032ROG032"
        : M4$="/RVG032ROG223RVG032ROG169RVG032RO"
        : M5$="/RVG032ROG032032032RVG032ROG032"
9190 PRINT"/CHD1/"
9200 PRINT L1$
9210 PRINT L2$
9220 PRINTM1$+T1$+T1$+E2$+T1$+T1$+T1$+X1$+T1$+M2$
9230 PRINTM1$+T1$+E2$+E2$+E2$+T2$+E2$+X2$+T2$+M2$
9240 PRINTM1$+T2$+E2$+E3$+E1$+E3$+T2$+E3$+T2$+T2$+M2$
9250 PRINTM1$+T2$+E1$+E1$+T2$+E2$+X4$+T2$+M2$
9260 PRINTM1$+T2$+T1$+T1$+T1$+T2$+T1$+X5$+T2$+M2$
9270 PRINT L2$
9280 PRINT L2$
9290 PRINTM1$+T1$+Y1$+T1$+T1$+T1$+M3$+T1$+"  " +M2$
9300 PRINTM1$+S1$+Y2$+S1$+T2$+E1$+M4$+S1$+" "+ M2$
9310 PRINTM1$+T1$+Y3$+T1$+T2$+E3$+M5$+T1$+"  "+M2$
9320 PRINTM1$+S2$+Y3$+S2$+T2$+E1$+M5$+S2$+"  "+M2$
9330 PRINTM1$+T1$+Y3$+T1$+T2$+T1$+M5$+T1$+"  "+ M2$
9340 PRINTL2$
9350 PRINTL1$
9360 PRINT"/D1L1D1/A COMPUTER ASSISTED LEARNING EXPERIMENT"
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.

GUIDEBOOK TO TELETEXT SYSTEMS
****

C O N T E N T S

****

TELETEXT   SYSTEMS
****

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 tapeslide 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.
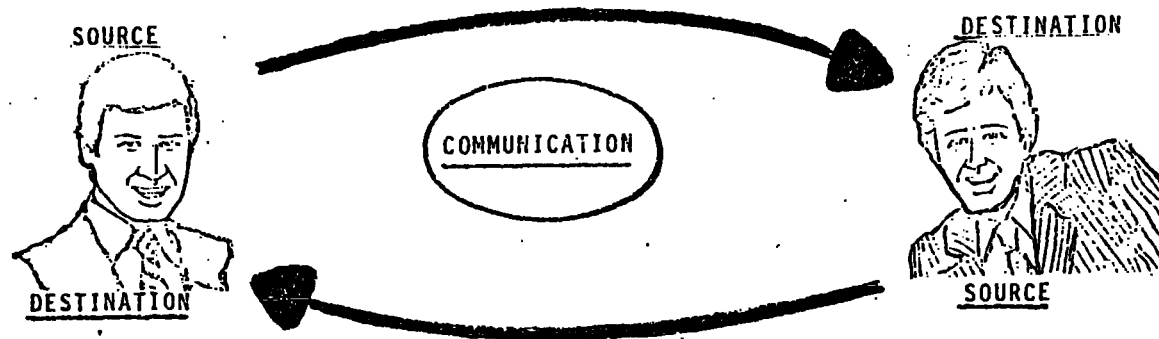
During their everyday lives people need to communicate one with another.

The purpose of communication usually is to desominate 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 consititute very effective methods of receiving information.

COMMUNICATION

INFORMATION DISSEMINATION AND

RETRIEVAL

NEWSPAPERS   MAGAZINES   BOOKS   CONVERSATION   LECTURES   RADIO   TELEVISION

6

```
┌──────────────┐                                    ┌──────────────┐
│              │         Communication              │              │
│   SOURCE     │─────────────────────────────────▶ │ DESTINATION  │
│              │            Channel                 │              │
└──────────────┘                                    └──────────────┘
```

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.

7

8

NEWSPAPERS

BOOKS

T.V. SET

RECIPIENT

ONE WAY COMMUNICATION

THE COMMUNICATION PROCESS

ENCODING   DECODING

```
+-------------+      +-------------+      +-----------+      +-----------+      +-------------+
| INFORMATION |      |             |      |           |      |           |      |             |
|   SOURCE    | ---> | TRANSMITTER | ---> |  CHANNEL  | ---> | RECEIVER  | ---> | DESTINATION |
|             |      |             |      |           |      |           |      |             |
+-------------+      +-------------+      +-----------+      +-----------+      +-------------+
      ^                                                                               |
      |                                 FEEDBACK                                      |
      +-------------------------------------------------------------------------------+
```
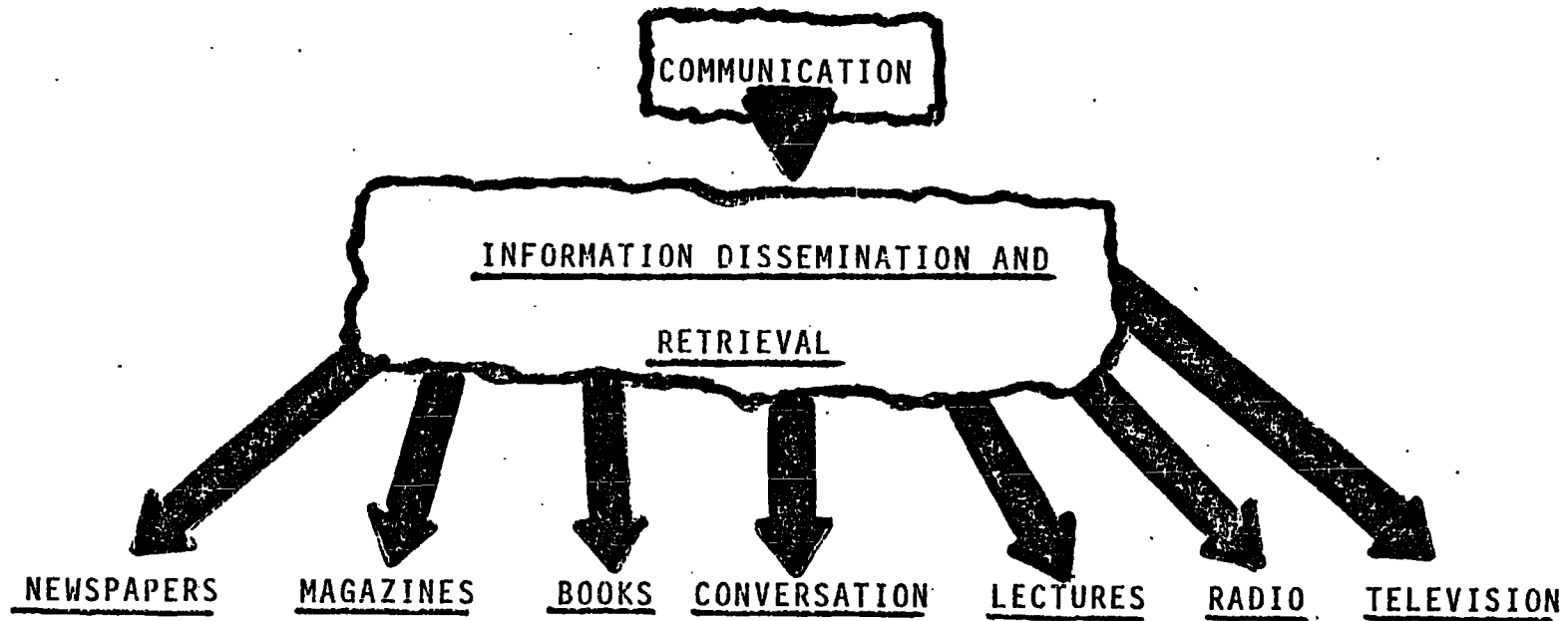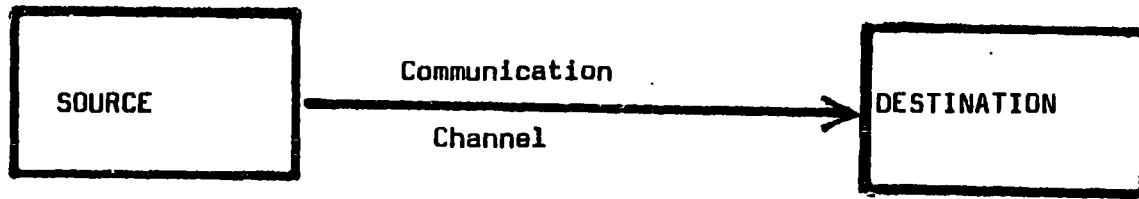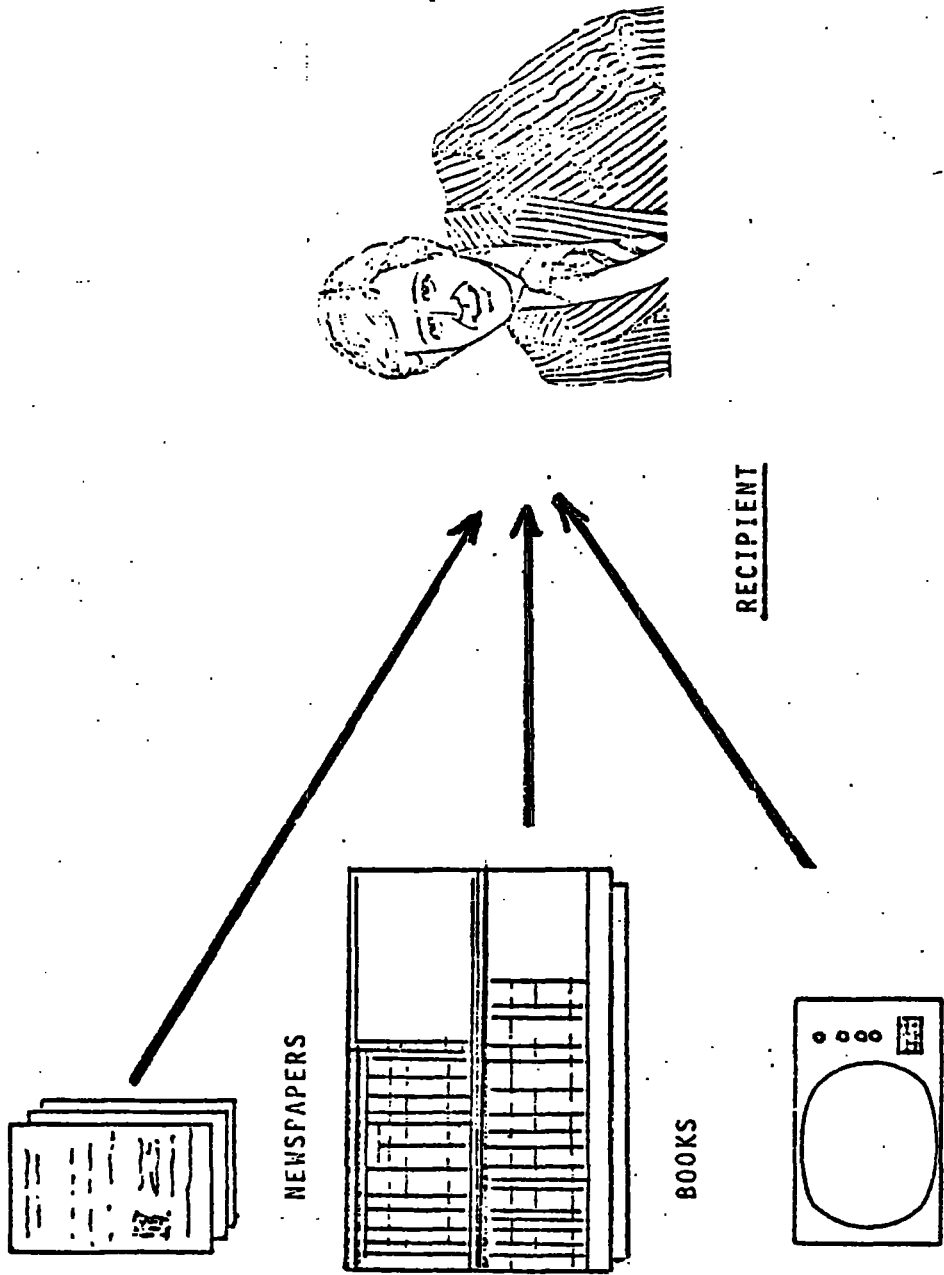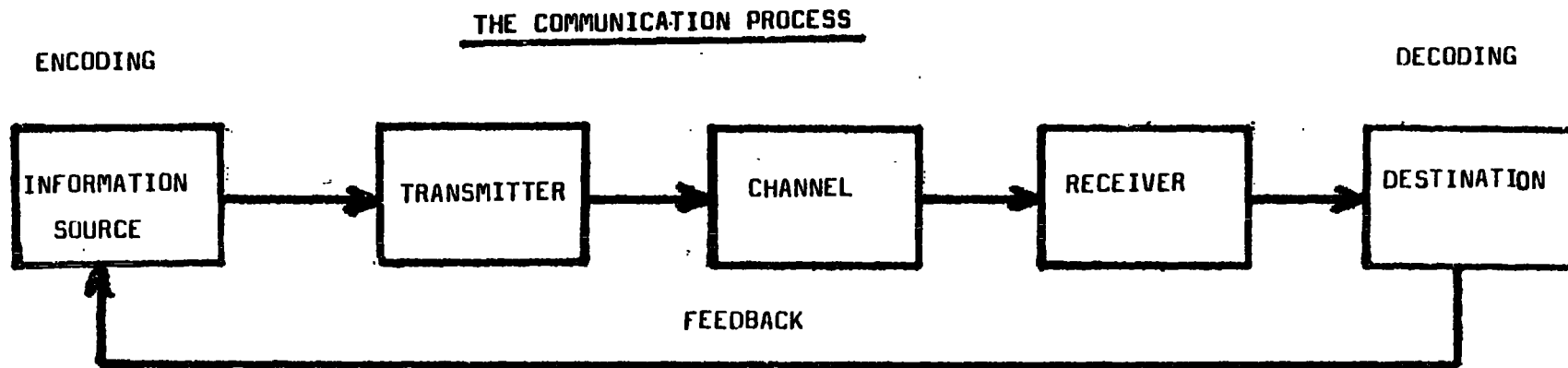
Reading a book, listening to the radio or watching television are examples of one-way methods of communication. Their major disadvantage is that you cannot ask them a question, that is, there is no interaction.

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
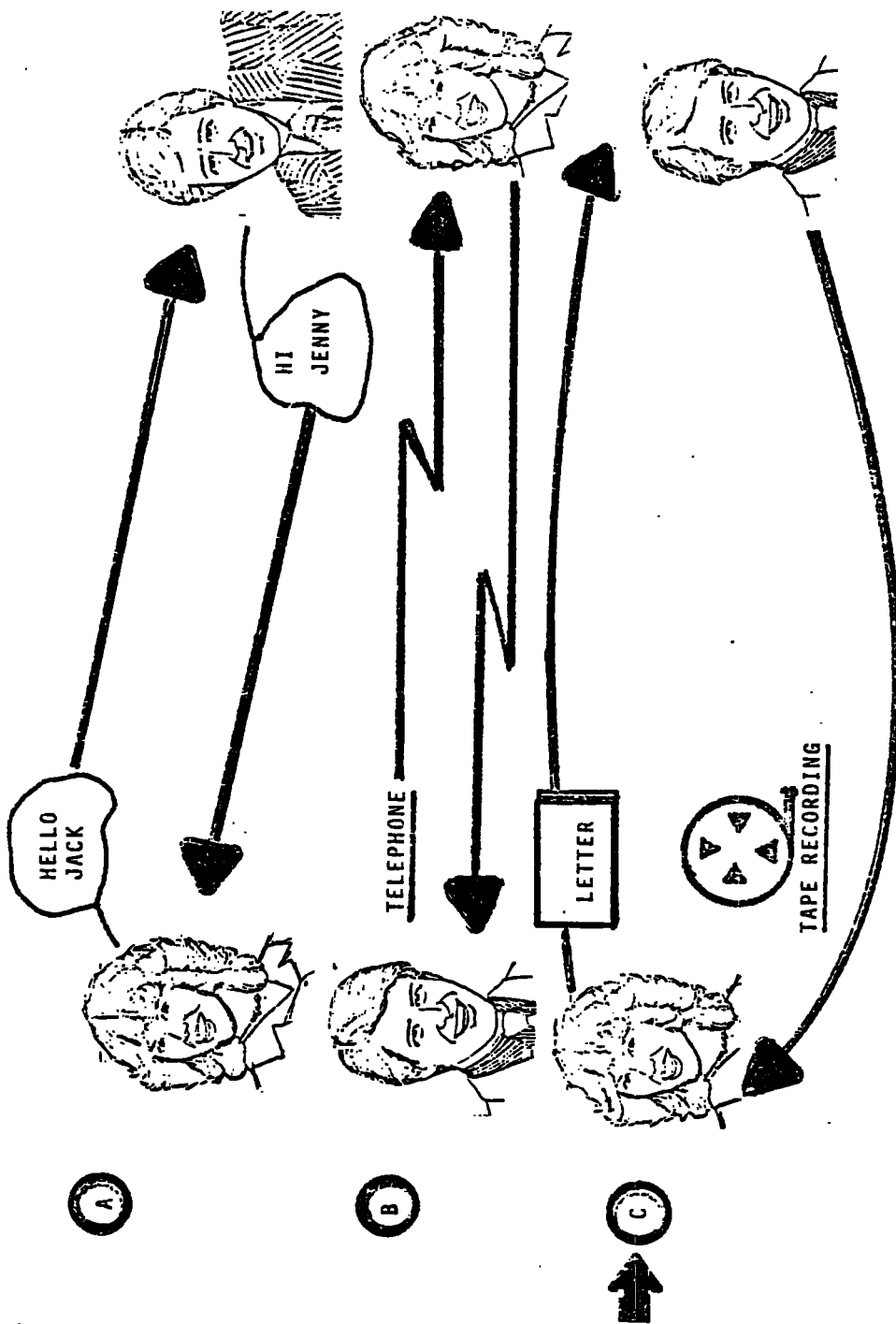
NOTICE IN EXAMPLE 'C' ABOVE HOW TWO DIFFERENT CHANNELS MAY BE USED TO CARRY INFORMATION.

THREE BROAD TYPES OF TELETEXT SYSTEM ARE DISCUSSED IN THIS PROGRAMME.

TELETExT SYSTEMS

A ONE WAY COMMUNICATION USING A TELEVISION CHANNEL
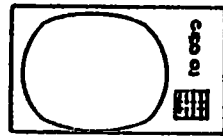
N.B. THE BROADCAST TELETEXT SYSTEMS 'CEEFAX' AND 'ORACLE' ARE EXAMPLES OF THIS TYPE.

B TWO WAY COMMUNICATION USING A TELEPHONE NETWORK
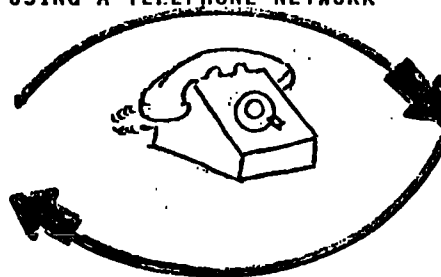
C TWO WAY COMMUNICATION USING BOTH A T.V. CHANNEL AND A TELEPHONE NETWORK
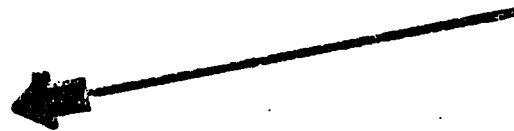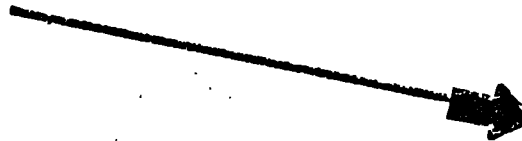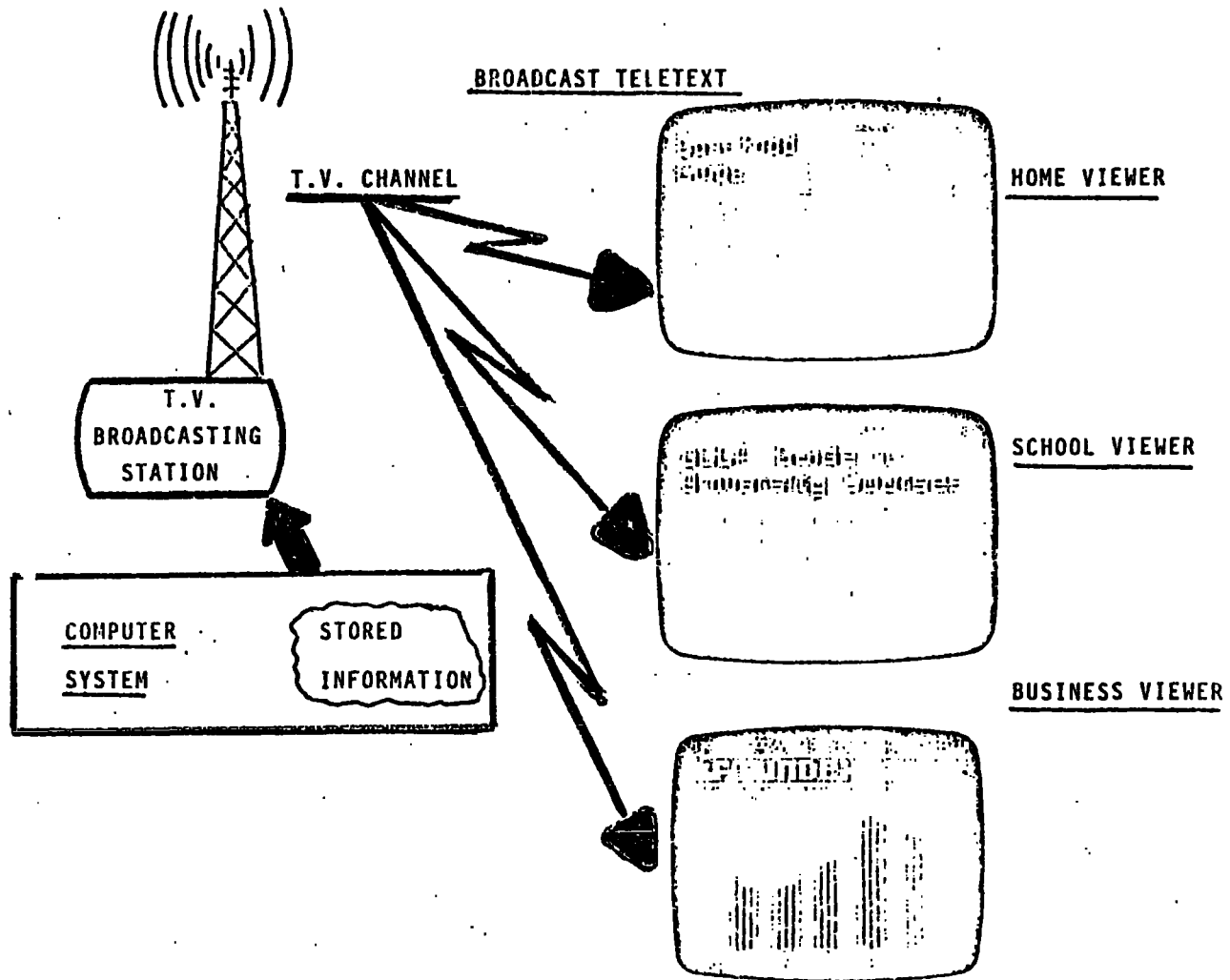
- 33 -

11

BROADCAST TELETEXT

T.V. CHANNEL

HOME VIEWER

SCHOOL VIEWER

BUSINESS VIEWER

T.V. BROADCASTING STATION

COMPUTER SYSTEM

STORED INFORMATION

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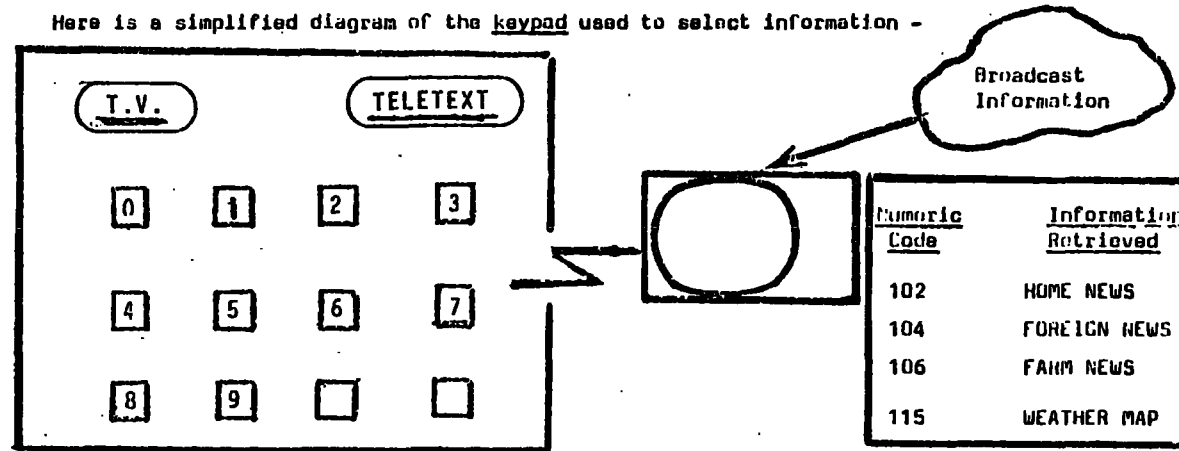
It can operate in two modes: TV or TELETEXT. The mode to be used is
selected by pressing an appropriately coloured button, say green for
TV and red for teletext. When in teletext mode the user can press the
numbered buttons, 1, 2, 3......... up to 9 in any sequence to form a
numeric code consisting of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

CONVENTIONAL
BLACK AND WHITE
OR
COLOUR TV RECEIVER

EXTRACTION
OF DATA
SIGNAL FROM
RECEIVED
VISION
SIGNAL

DATA
SEPARATION

CHARACTER
GENERATOR

VIEWERS
CONTROL

PAGE
SELECTION

DATA
STORE

PRESERVATION
OF RECEIVED
INFORMATION
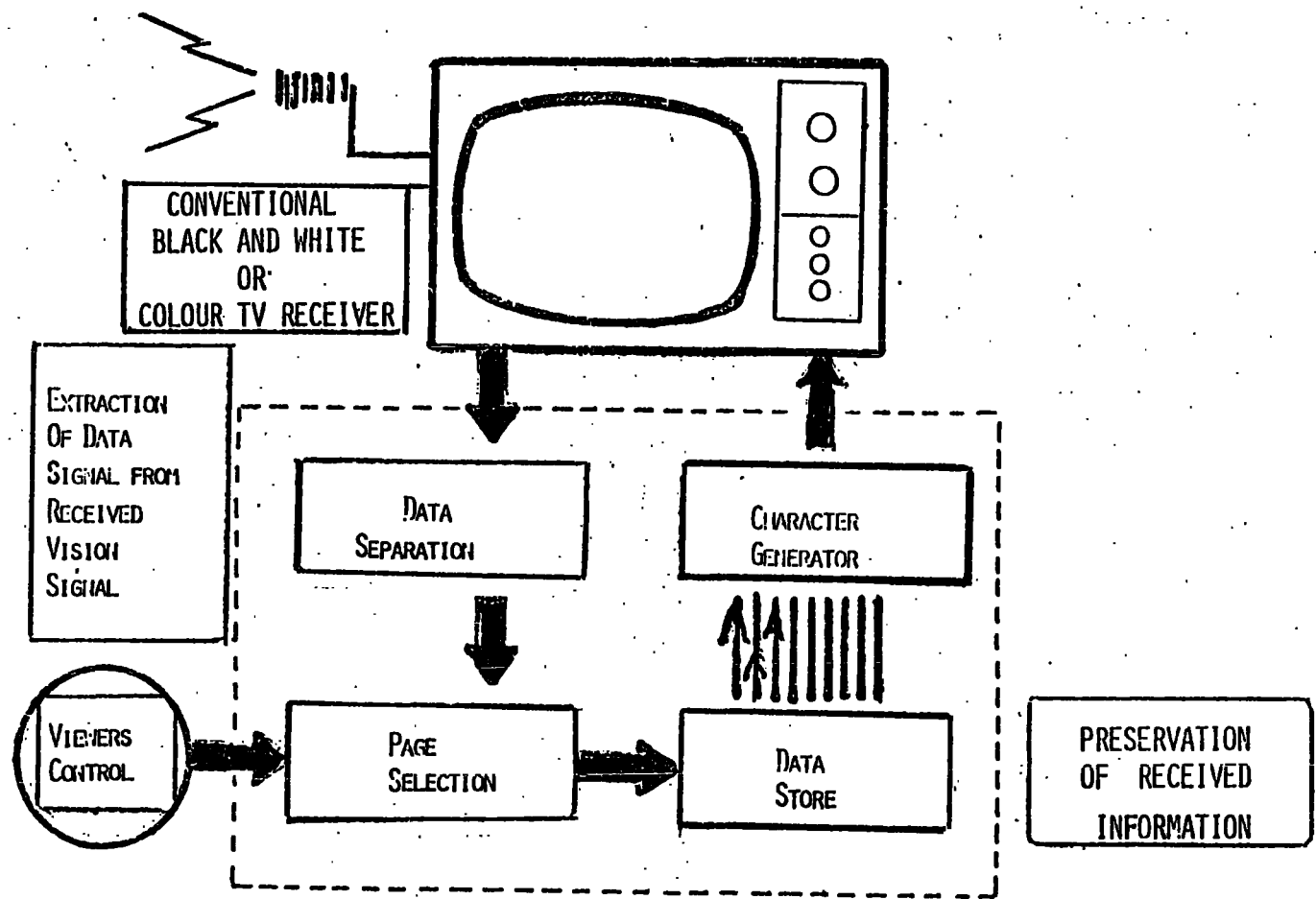
ADDITIONS TO DOMESTIC TV RECEIVER TO RECEIVE TELETEXT

14

BBC Ceefax

"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

'ORACLE' is the name given to the Independent
Broadcasting Authority's teletext system.

Why 'ORACLE'? See answer on page 17.

UNITED KINGDOM BROADCASTING AUTHORITIES
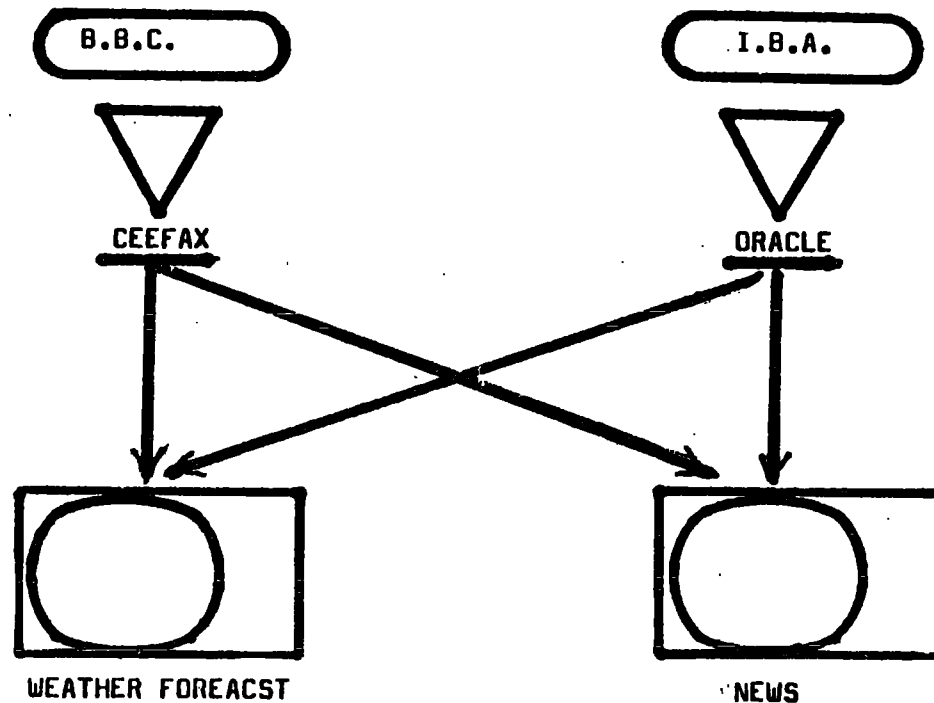
CEEFAX (See Facts) is the name of the BBC system with information being broadcast over BBC 1 and BBC 2.

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.

17

PAGE NUMBER ——⟶ 176   03 07 79 ⟵—— DATE

LINES OF TEXTUAL
INFORMATION OR
SIMPLE PICTURES
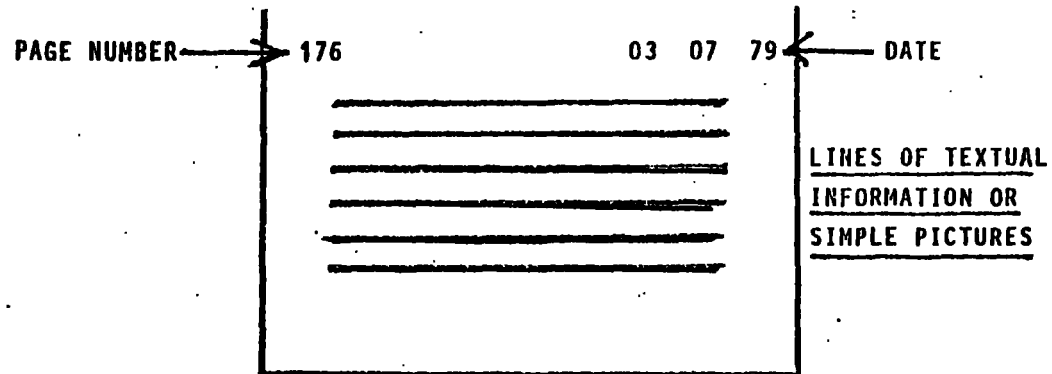
COMPUTER STORAGE OF INFORMATION
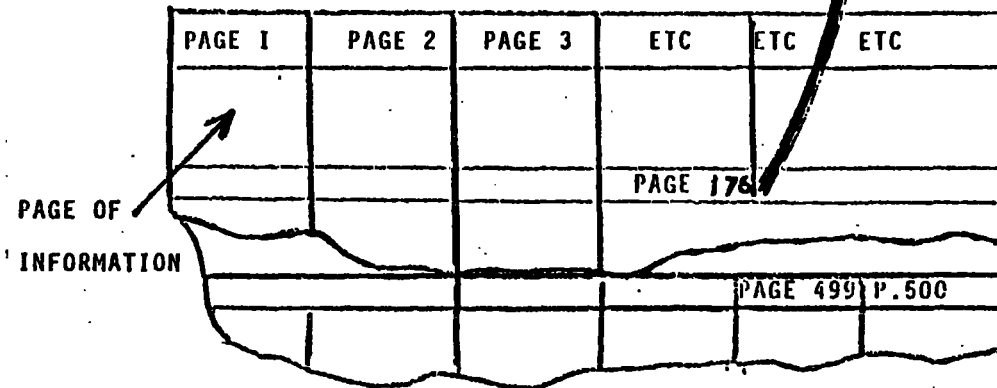
PAGE 1	PAGE 2	PAGE 3	ETC	ETC	ETC
			PAGE 176		
			PAGE 499	P.500	

PAGE OF
INFORMATION

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 the tells the user
the age of the information that the page carries.

```
Pg106    ORACLE 204 Tue24Aug ITU :15.22/46
```

ORACLE

RAIN OR SHINE?

NEW SOURCE OF ENERGY FOUND?

WHO WON THE DERBY?

TODAY'S BEST FOOD BUYS?

WHAT'S ON AT THE CINEMA?

ORACLE

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.

ORACLE INDEX

CEEFAX 100   Wed 18 Jun   09 59/49

CEEFAX

	Dial			Dial
Headlines	101	WEATHER MAP	115
Home News	102		
Home News	103	DETAILS OF:	
Foreign news	104	Travel, Weather,	
News briefs	105	BBC News	110
Farm news	106	Business and	
Consumer news	107	Electronics	120
People	108	Sport, Events,	
Charivaria	109	Tourist News	130
		Consumer Pages,	
NEWSFLASHES>>>150		Test Designs	140

Updated between 8am and 6pm.

A full CEEFAX magazine will be 100 pages

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 tempertures below 20 degrees centigrade while red is used to iddicate 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.
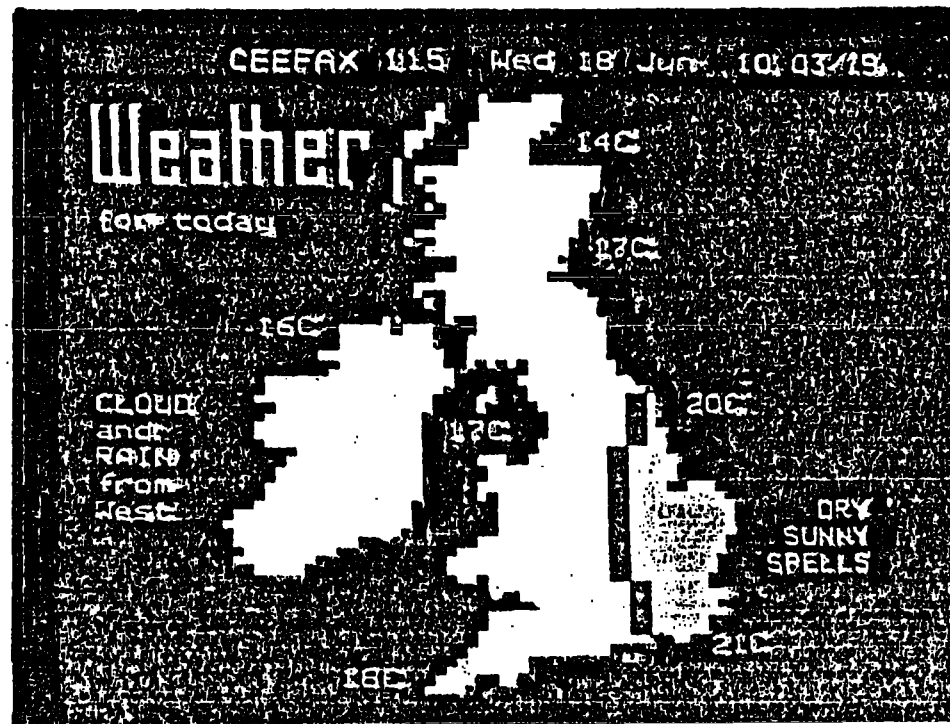
TELETEXT TRANSMISSION COLOURS
****

Mixing the primary colours and adding white gives us the <u>seven</u>
teletext transmission colours which are standard on all types of
teletext system:

> 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.Colourcan 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 GRARHICS 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.
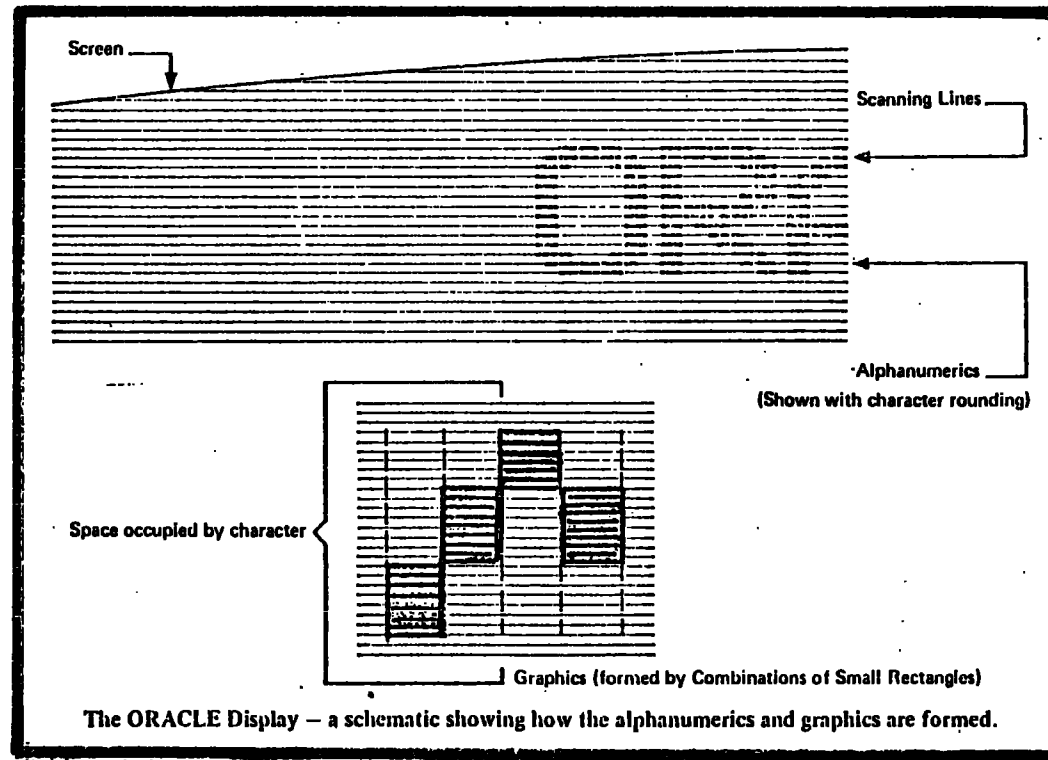
Notice that graphics are formed by assembling small illuminated rectangles which
are each one sixth of the size of the space occupied by a standard character. This
gives them a 'square edged' appearance.

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.

Television line containing ORACLE data

Part of line expanded

Signal Level

360 Binary Digits

625 Lines

Television Picture Area

Screen

Other Test Signals

Lines with ORACLE data
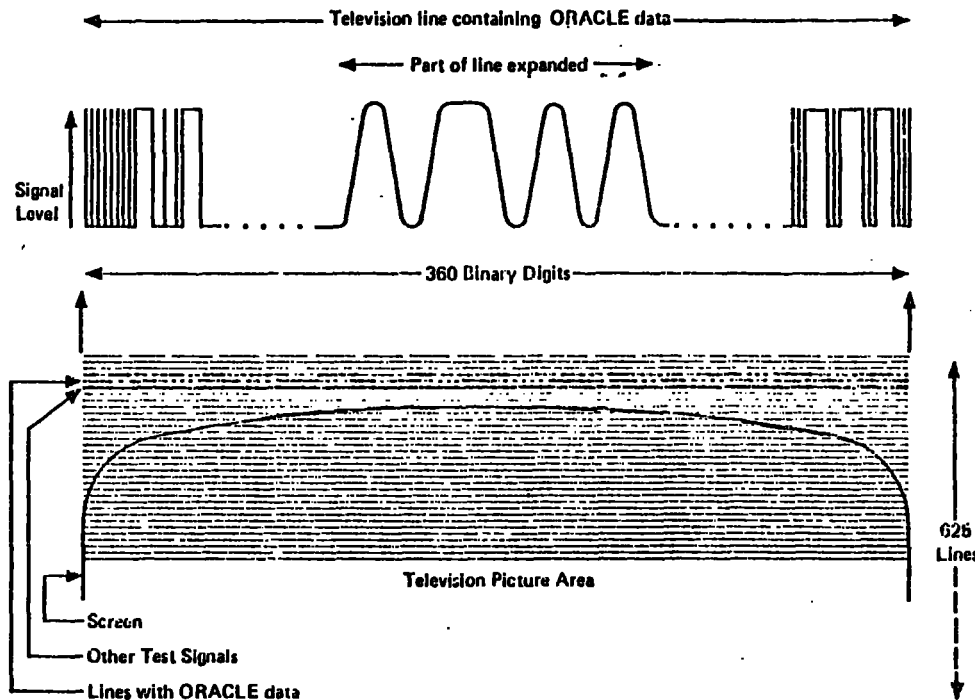
The position of the ORACLE data signals

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.

100% — — — — — — — — — — — White Level — — — — — — — —

|←———Data Fills Active Line———→| |←——Data Fills Active Line——→|

66% ± 6%

Signal
Levels

| Clock Run-in | Framing Code | Magazine and Row Address | Page Number | Time Minutes | Time Hours | Control Group | 32 Display Characters |
| (16) | (8) | (16) | (16) | (16) | (16) | (16) | (8,8,...) |

Page Header

| Clock Run-in | Framing Code | Magazine and Row Address | 40 Display Characters |
| (16) | (8) | (16) | (8,8,8,....) |

Remaining Lines

0%

Colour Burst   (The figures in brackets are the number of binary digits)

ORACLE data organisation

Notice that each CHARACTER transmitted requires <u>8</u> 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.

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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.

SUMMARY OF ORACLE PAGE DETAILS

SINGLE PAGES	–	MAXIMUM 800
MULTIPAGE EXTENSIONS	–	NO UPPER LIMIT BUT USUALLY
		1 – 5 PER PAGE WHEN USED
TIME CODED PAGE EXTENSIONS	–	MAXIMUM 24 x 60
		(HOURS AND MINUTES PER PAGE WHEN USED)
COLOURS FOR BACKGROUNDS	–	RED, GREEN, BLUE, CYAN,
'GRAPHICS CHARACTERS'	–	MAGENTA, YELLOW AND WHITE
CHARACTERS PER ROW	–	40 MAXIMUM
ROWS PER PAGE	–	24 MAXIMUM
ROW TRANSMISSION RATE	–	100 PER SEC.
CYCLE TRANSMISSION OF PAGES		

THE <u>MAJOR</u> 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 <u>to keep access time down to a minimum.</u>

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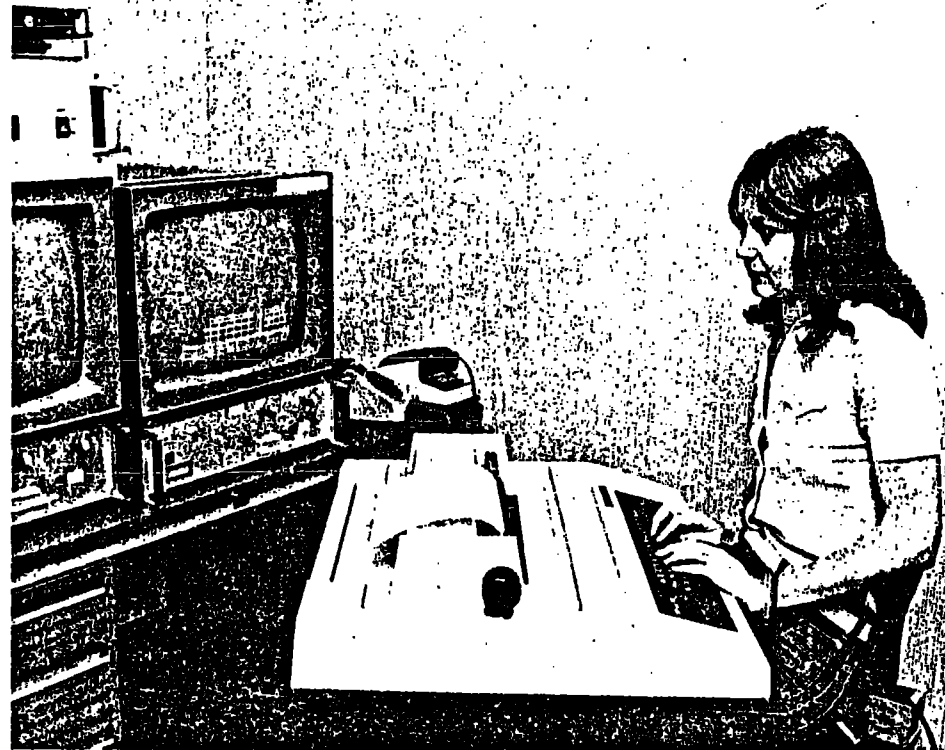
The 'CEEFAX' editing system works in exactly the same way. The news editors
type in new facts or information which replaces that which is out of date.
In this way users of the system always receive accurate, up-to-date information.

TELETEXT SYSTEMS

Ⓐ **BROADCAST TELETEXT**

    (A)   CEEFAX

    (B)   ORACLE

➡ Ⓑ **VIEWDATA SYSTEMS**

    (A)   PRESTEL   - UK

    (B)   ANTIOPE   - 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.

VIEWDATA CONNECTIONS

Strowger, Crossbar or T.X.E. environment

telephone exchange

viewdata computer

data banks

75 bits/sec

1200 bits/sec

t.v. set

viewdata adapter

dial or push button telephone

keypad

local telephone exchange

other customers

viewdata phone

equipment in the home

equipment in the office.
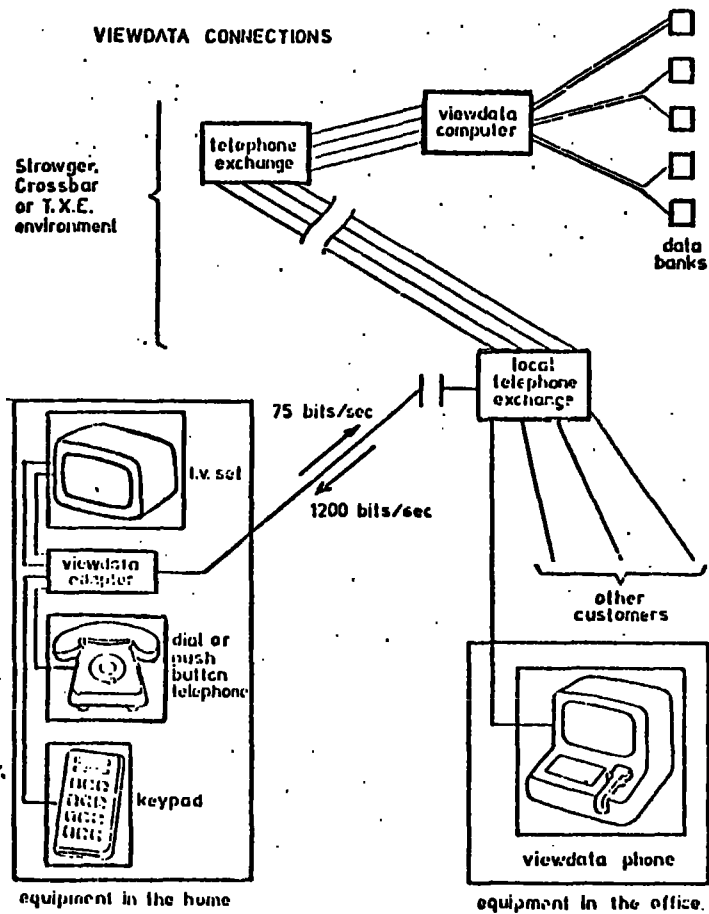
Here is the diagram from which the slide was produced. Notice the telephone network which is fundamental to the successful operation of the vewdata system. Information flows through the network at two different speeds. Transmission is at 1200 bits/ second in receive mode and 75 bits/sec. in transmit 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 one each for start and stop marks.

TELETEXT TREE STRUCTURE
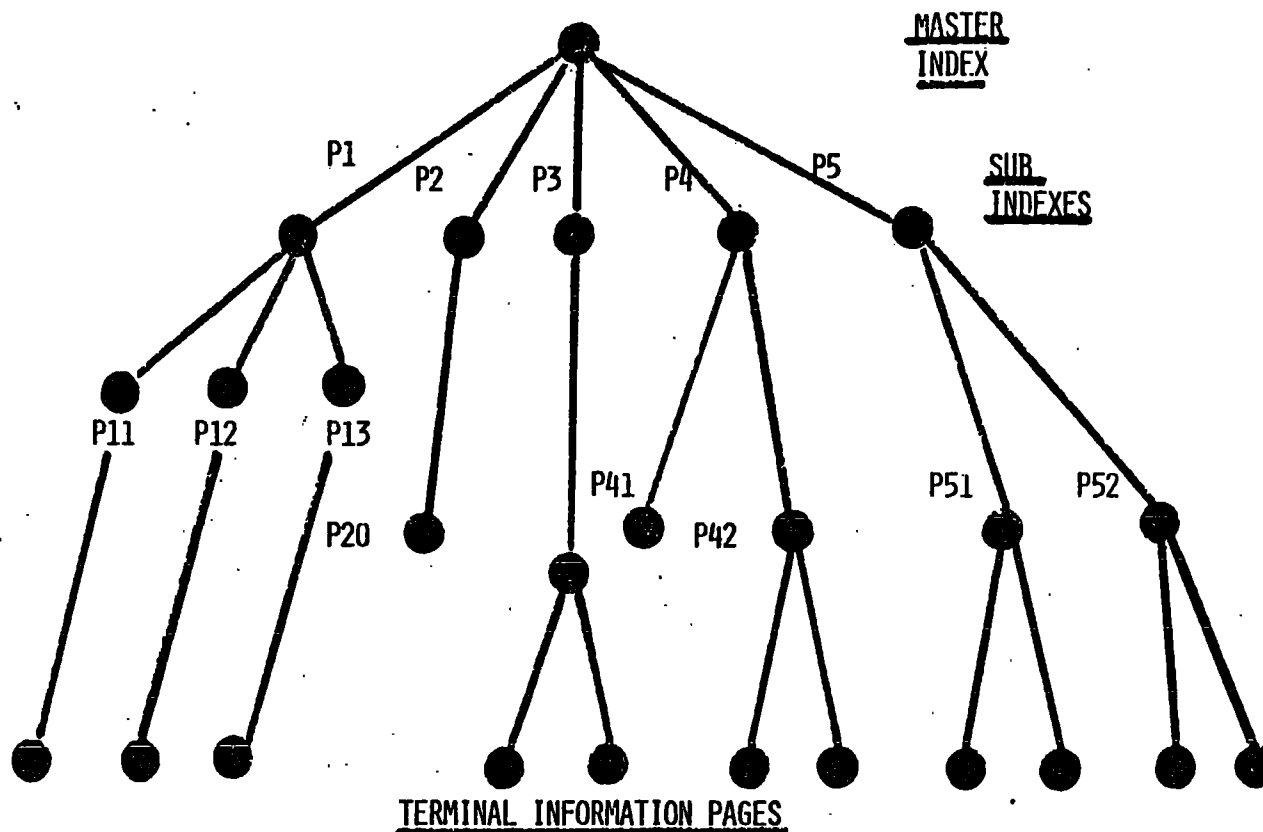
MASTER
INDEX

SUB
INDEXES

P1   P2   P3   P4   P5

P11   P12   P13

P20

P41   P42

P51   P52

TERMINAL INFORMATION PAGES

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 VIEWDATA SYSTEM

COMPUTER STORE

COMPUTER SYSTEM

TELEPHONE NETWORK

TELEPHONE

TELEVISION SET

KEYPAD
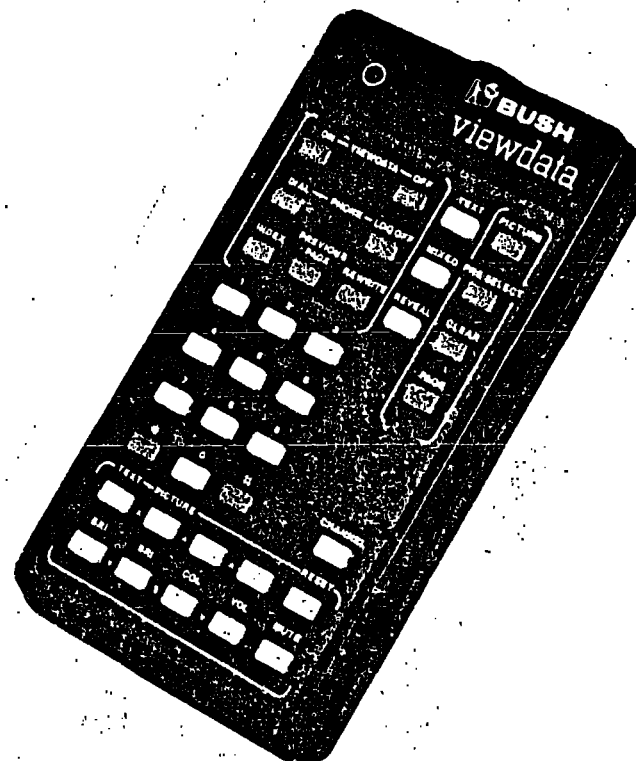
INFORMATION USER

INFORMATION PROVIDER
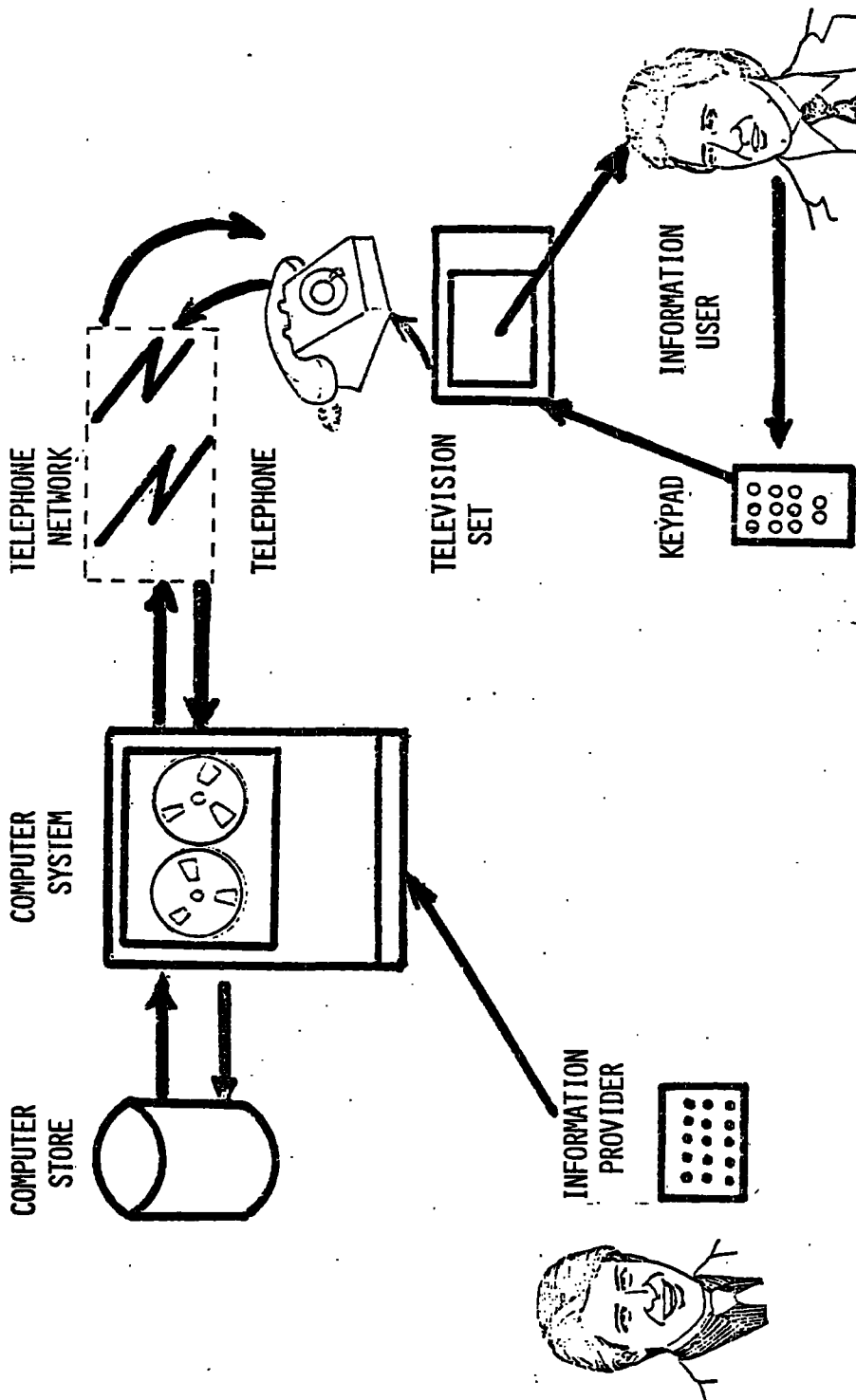
```
                    ┌─────────────────┐
                    │       THE       │
                    │  PRESTEL USER'S │
                    │   GUIDE AND     │
                    │   DIRECTORY     │
                    └─────────────────┘
                            ▼
```

TYPICAL CONTENTS

INFORMATION PROVIDER	PAGE NO
SCITEL (INSTITUTE FOR SCIENTIFIC INFORMATION)	555
INTERNATIONAL DISTILLERS AND VINTNERS	29260
ICI PLASTICS DIVISION	424
W.H. SMITH	400
MIDDLESEX POLYTECHNIC	226
STOCK EXCHANGE	520
UCKIS	541

There are over 150 information providers who have between them booked over 180,000 pages
of information space. Some examples are shown above.

HERE IS A SEQUENCE LEADING THE USER OF PRESTEL TO A CAR OF HIS CHOICE. EACH STEP LEADS

LOGICALLY ON TO THE NEXT. READ LEFT TO RIGHT FROM THE TOP.

Some information providers produce educational material. Here is an

illustration of the first frame in a series of information pages on

Labour Law.
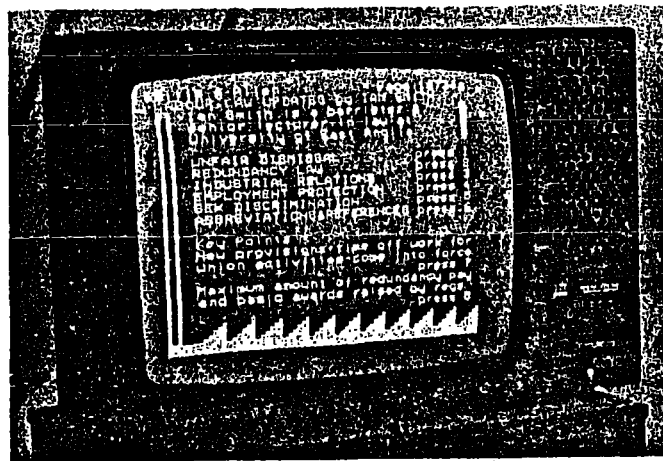
The unit on top of this TV set is converting the standard domestic
TV receiver into a teletext receiver.
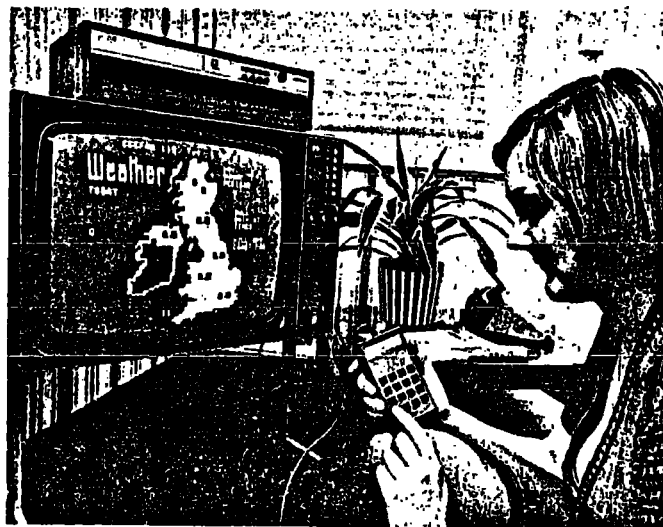
PRESTEL PRESENT

- 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

AND 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.

TELETEXT

(A) __BROADCAST TELETEXT__

    (A) CEEFAX

    (B) ORACLE

(B) __VIEWDATA SYSTEMS__

(A)	PRESTEL	– UK
(B)	ANTIOPE	– FRANCE
(C)	BILDSCHIRMTEXT	– GERMANY
(D)	TELEDON	– CANADA

→ (C) __MIXED MEDIA SYSTEMS__

(A)	PLATO	– UNIVERSITY OF ILLINOIS USA
(B)	CYCLOPS	– OPEN UNIVERSITY – UK

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
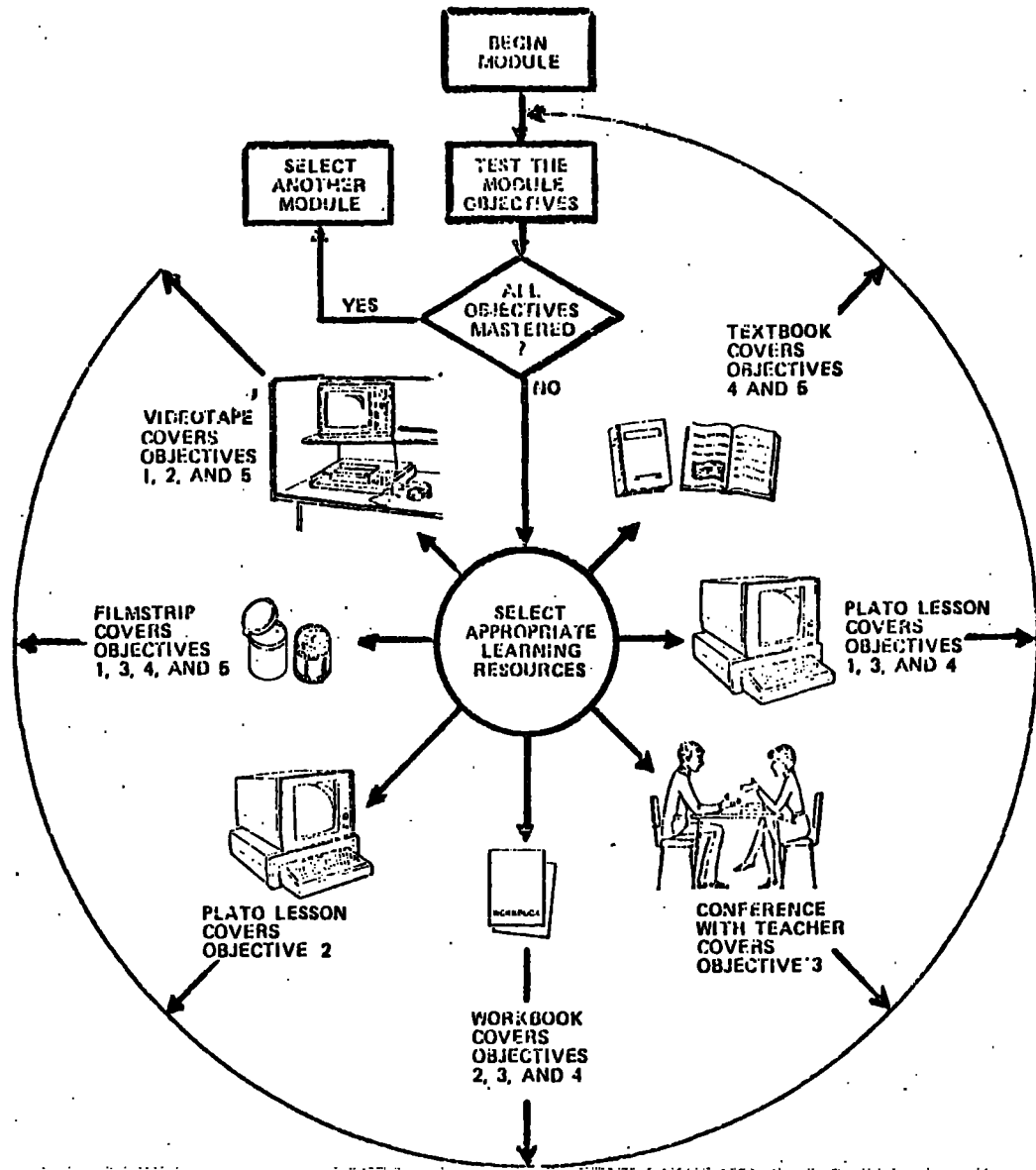valuable for education and training both in colleges and in industry.

PLATO

PROGRAMMED LOGIC FOR AUTOMATIC TEACHING OPERATIONS

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.

45

```
        ┌──────────────┐
        │  BROADBAND   │
        │ T.V. CHANNEL │
        └──────────────┘
┌──────────────┐        ┌──────────────┐
│   PLATO      │        │    PLATO     │
│ COMPUTER SYS.│        │  TERMINAL    │
└──────────────┘        └──────────────┘
        ┌──────────────┐
        │  TELEPHONE   │
        │  NETWORK     │
        └──────────────┘
```
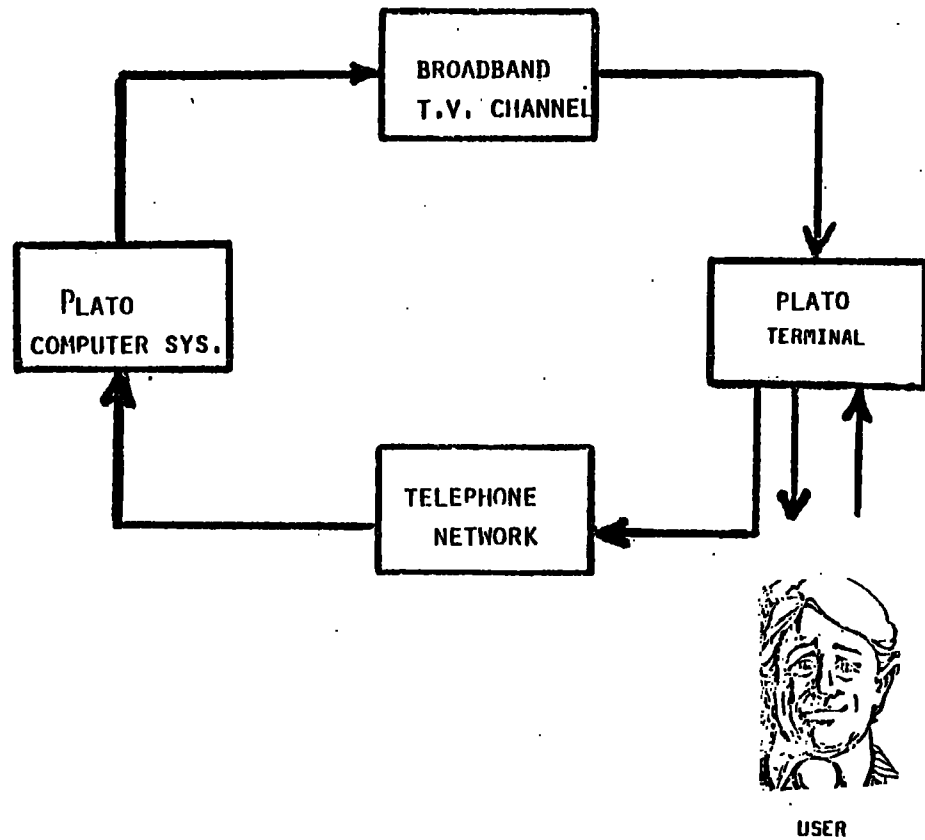
USER

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.

BEGIN MODULE

SELECT ANOTHER MODULE

TEST THE MODULE OBJECTIVES

ALL OBJECTIVES MASTERED?

YES

NO

SELECT APPROPRIATE LEARNING RESOURCES

VIDEOTAPE COVERS OBJECTIVES 1, 2, AND 5

TEXTBOOK COVERS OBJECTIVES 4 AND 5

FILMSTRIP COVERS OBJECTIVES 1, 3, 4, AND 5

PLATO LESSON COVERS OBJECTIVES 1, 3, AND 4

PLATO LESSON COVERS OBJECTIVE 2

CONFERENCE WITH TEACHER COVERS OBJECTIVE 3

WORKBOOK COVERS OBJECTIVES 2, 3, AND 4

'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:

> Videotape
> Workbooks
> 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 resourc es 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.

PICTURE

VOICE

Reset

Standard
stereo
cassette

Pause   CYCLOPS   Forward/back

48
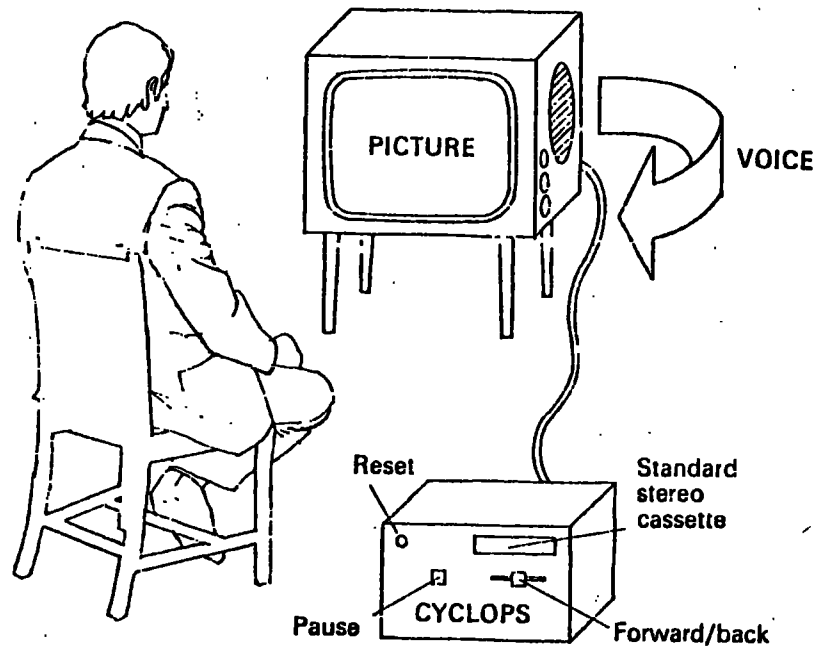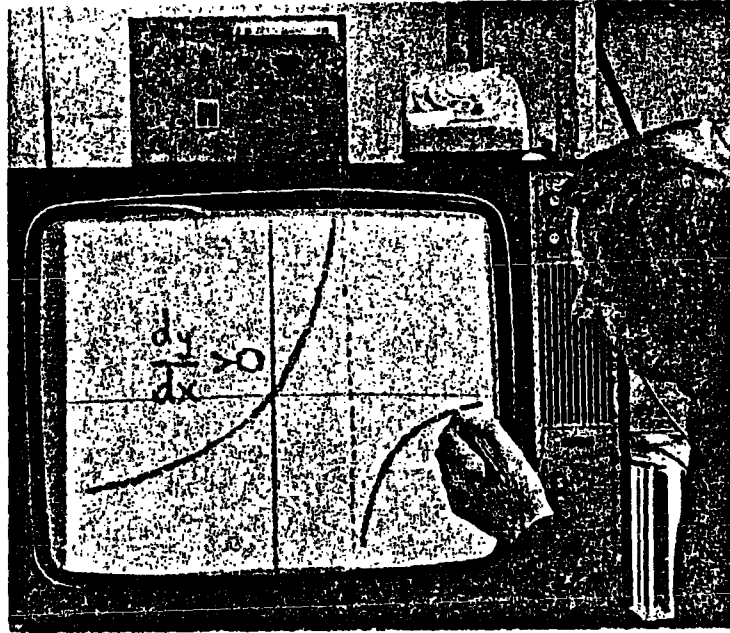
This picture shows a user of the CYCLOPS system interacting with an
image on the screen by means of a light pen...Notice that the CYCLOPS
CONVERTER is standing on the top of the TV set alongside a conventional
telephone. The telephone may be used to connect the system to an
external computer via a telephone 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.

VOICE

CYCLOPS

MODEM

Telephone line
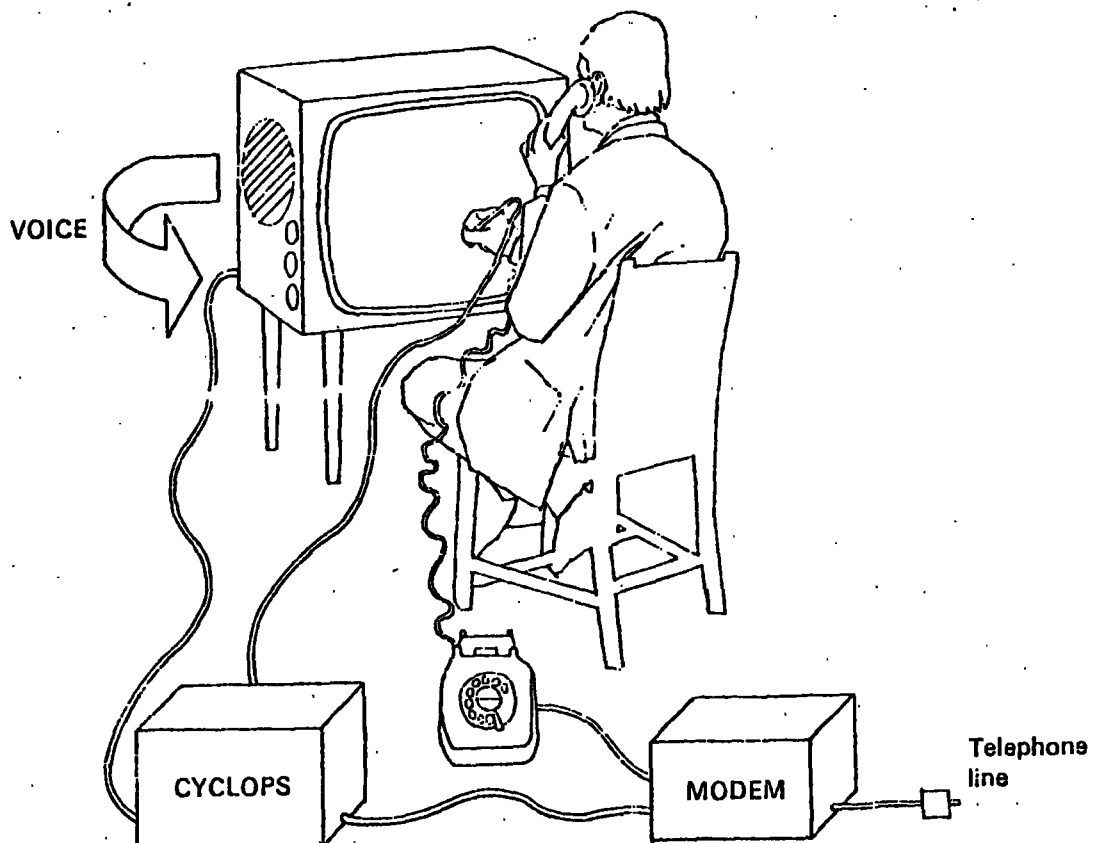
Adding a simple stereo cassette recorder to the basic CYCLOPS system allows a teacher or student to make simple tapes.

CASSETTE RECORDER
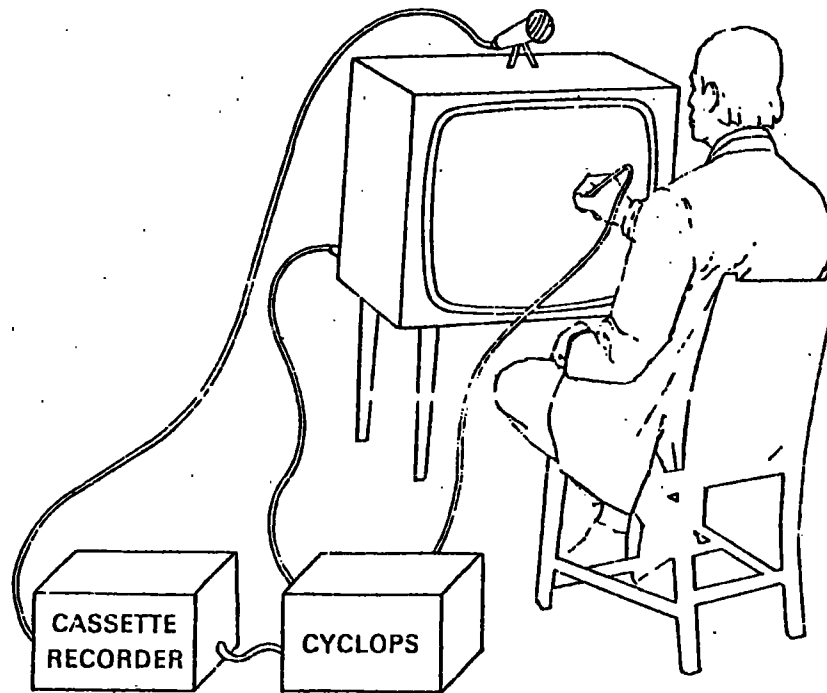
CYCLOPS

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.
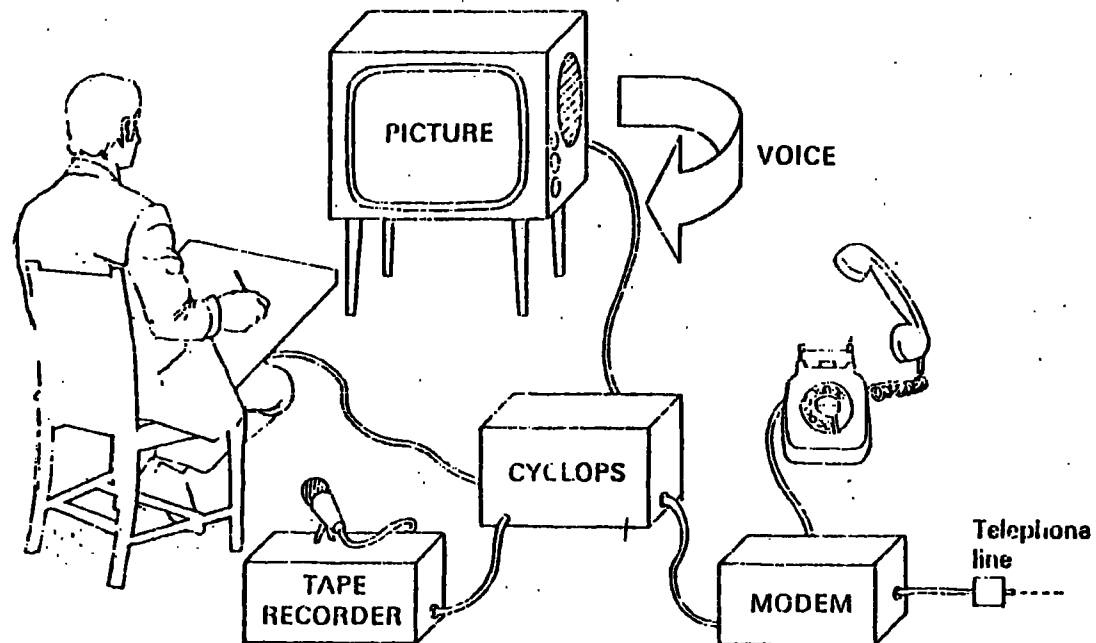
The diagram below illustrates the wide capability of the CYCLOPS system being developed
by the Open University in the UK. It shows a complete recording and central communications
centre with TV camera input. Such a system would enable the teacher to make very
sophisticated tapes with graphics stored on the computer.
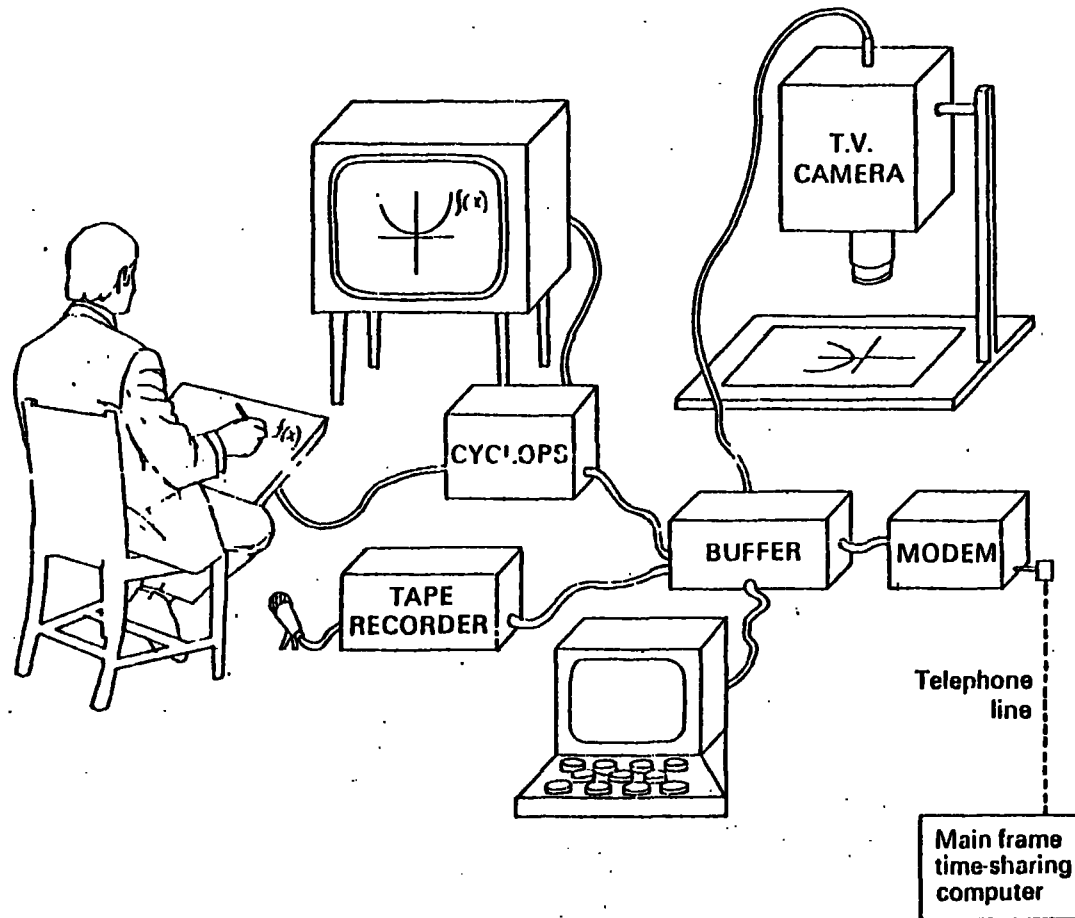
The user of the CYCLOPS system can also point to a set of characters with the
light pen. This provides a cheap visual display unit. The addition of a keyboard
provides a more convenient visual display unit. Because the screen is constructed
from a conventional TV set it is not touch sensistive and a light pen must be used.
However, this terminal is compatible with and may be used to receive ORACLE and
CEEFAX messages bexause the system uses a standard TV set.
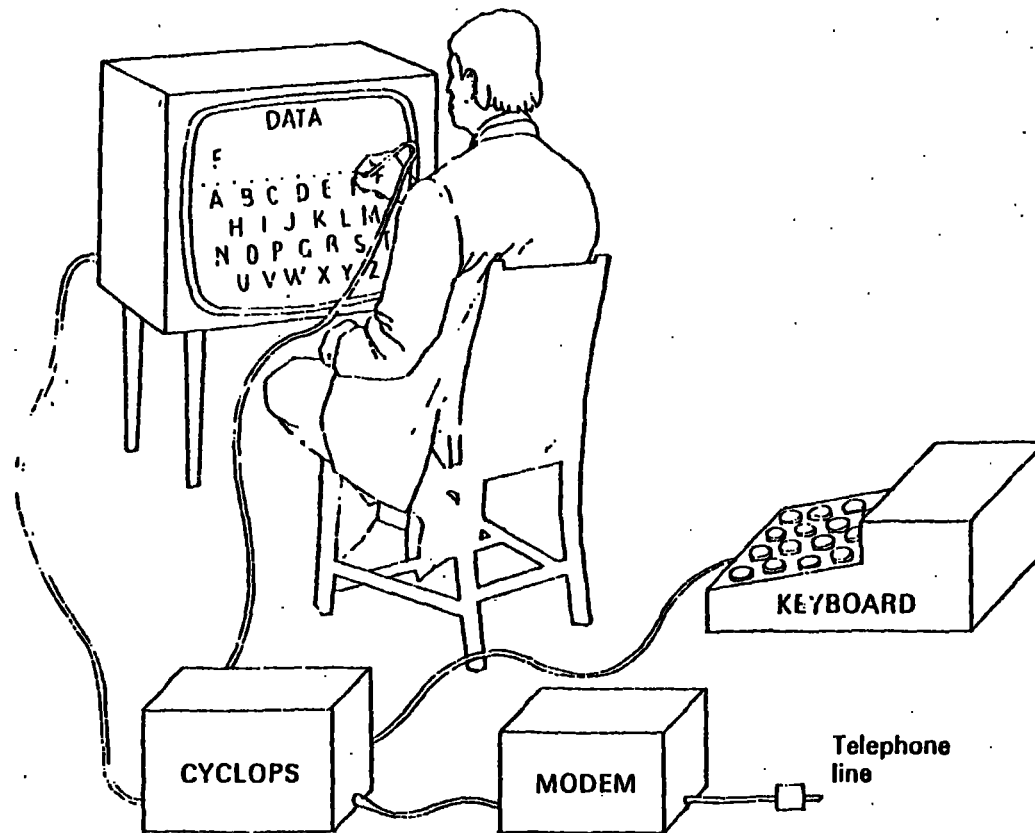
In the CYCLOPS system graphic material is produced either via computer programs
or by digitizing conventional photographs and diagrams.

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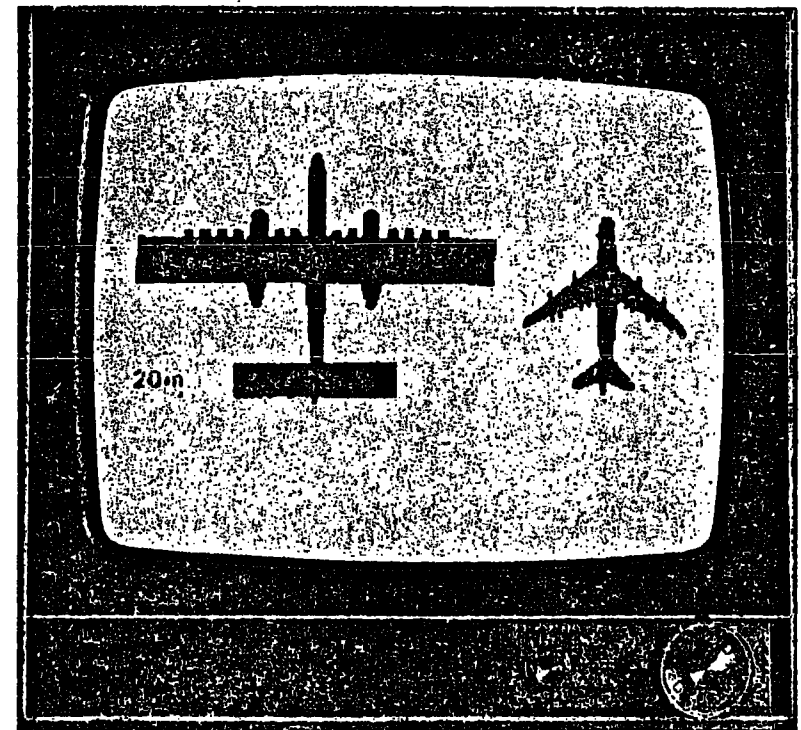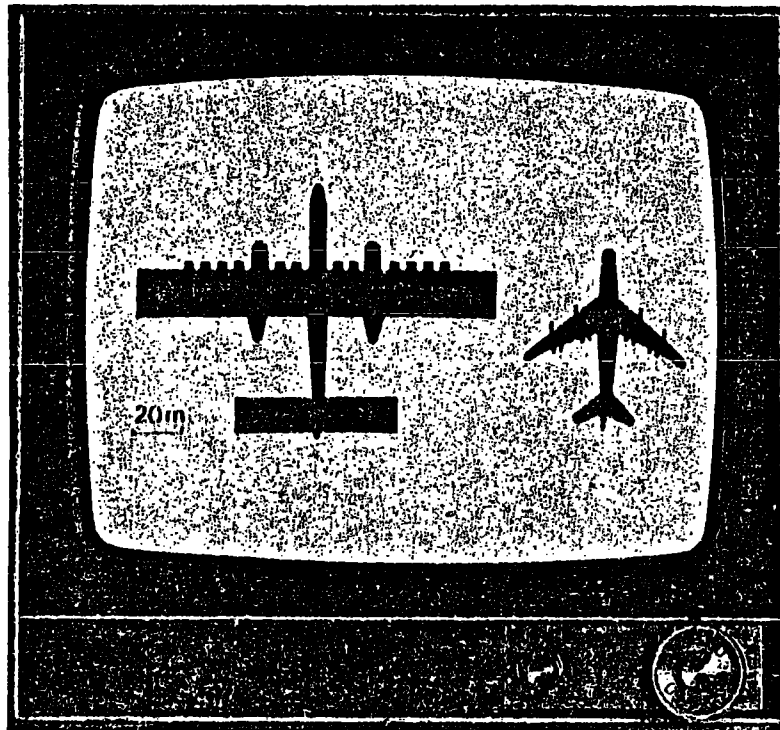
Here is a picture of an author's studio. The author is the person responsible
for preparing material to be transmitted to the user of the system. The studio
contains facilities for producing audio recordings, taking photographs and
converting them into computer readable format and a terminal which the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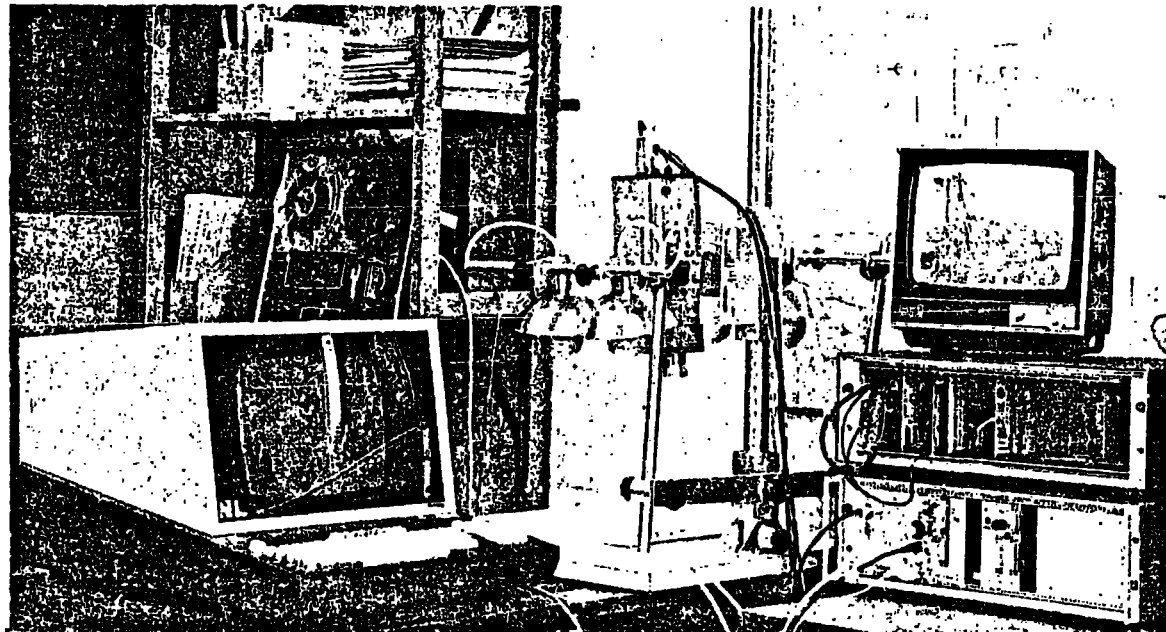
TELETEXT SYSTEMS

AIDING HUMAN COMMUNICATION VIA COMPUTER
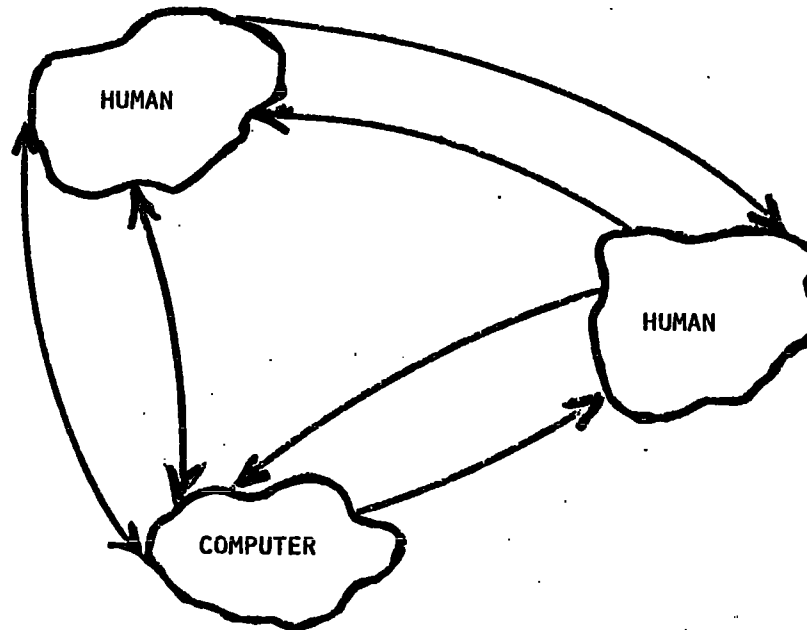
In this computer assisted tapeslide presentation we have looked at the subject
of communication between one human and another. We have seen how teletext systems
in conjunction with computer systems can help solve some of the problems of
communication over geographically large areas and how such systems may be employed
for the future benefit of society on a local, national and world-wide basis.

TELETEXT SYSTEMS -

Reading List

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(2) Langton Information Systems, Study of In-house Use of Viewdata by Organisations, British Library Research and Development Report 5384, June 1977.

(3) Stokes, A.V., VIEWDATA - A Public Information Utility, Langton Information Systems Series, ISBN: 0-905897-218, 1979.

(4) Sigel, E. (ed.), Videotext - The Coming Revolution in Home and Office Information Retrieval, Knowledge Industry Publications, ISBN: 0-914236-415, 1979.

(5) Money, S.A., Teletext and Viewdata, Newnes Technical Books, ISBN: 0-408,00378-2, 1979.

(6) Fedida, S., Screened Information at the Touch of a Button, Post Office Telecommunications Journal, 4-6, Winter 1976.

(7) Fedida, S., VIEWDATA: An Interactive Information Medium for the General Public using the Telephone Network, 6th International Broadcasting Convention, 107-112, January 1976.

(8) Fedida, S., VIEWDATA: Development of Computer-based Information Services for the General Public, 2nd International Symposium on Subscriber Loops and Services, IEE, 127-132, 3-7 May 1976.

(9) Fedida, S., VIEWDATA: An Interactive Information Service for the General Public, Proc. European Conference on Communications Networks, 261-282, 1975.

(10) The Prestel Users Guide and Directory, Volume 2, No.1, January 1979.

(11) Viewdata Progress Challenges Prestel, New Scientist, p.85, 10 April 1980.

(12) Jackson, R.N., Home Communications I : Teletext and Viewdata, IEEE Spectrum, Volume 17, No.3, 26-32, March 1980.

(13) Reid, A.A., Home Communications II : Creating a Market for Prestel, ibid., p.26.

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

(15) Bitzer, D.L., The Wide World of Computer Based Education, Advances in Computers, Volume 15, 239-281, 1976.

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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

P.G. Barker and H. Yeates

University of Durham
Sunderland Polytechnic

April 1980

SLIDE 0.5 (Blue background)

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

SLIDE 1 (Title slide)

SLIDE 1.5 (Communication)

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.

SLIDE 2

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.

SLIDE 2.5

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.

SLIDE 3

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.

SLIDE 4

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.

SLIDE 4.5 (Now turn to the computer screen)

SLIDE 5

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 <u>Broadcast Teletext System</u>.

SLIDE 6

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.

SLIDE 7

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.

SLIDE 8

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.

SLIDE 12

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.

SLIDE 12.5   (Now turn to the computer screen)

SLIDE 13

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.

SLIDE 14

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.

SLIDE 15

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 alphanumeric 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 ANTIOPE. Most other countries, such as Germany, Canada and Japan also have similar viewdata systems.

In contrast to the broadcast teletext systems, viewdata is an <u>interactive</u> <u>system</u> 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 <u>user terminal,</u>
(b)   a <u>telephone,</u>
(c)   a <u>telephone network,</u>
(d)   a <u>computer system,</u>
(e)   the <u>information provider's terminal.</u>

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 catagories 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.

SLIDE 45

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.

SLIDE 46

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.

SLIDE 47

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.

SLIDE 48

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.

SLIDE 49

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.

SLIDE 50

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.

SLIDE 51

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.

SLIDE 52

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.

SLIDE 53

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.

SLIDE 54

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.

SLIDE 55   (Trailer: The End)

SLIDE 56   (Trailer: Credits)

SLIDE 56.5   (Now turn to the computer screen)

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.

TELETEXT SYSTEMS

Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
1 - 4	1. What is the major disadvantage of some conventional methods of communication such as books, manuals and newspapers?	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?	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).

Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
5 - 9	3. Different types of teletext system are discussed in this programme. How many broad types of teletext system are there?	A. TWO B. THREE C. FOUR D. FIVE	The answer is 'B'. Three broad types of teletext system are discussed in this programme. They are: - One-way communication using a TV channel; - Two-way communication using a telephone network; and - Two-way communication using a combination of a TV channel and a telephone network.
5 - 9	4. How does the user obtain access to the information broadcast by the CEEFAX and ORACLE systems?	A. By dialling a special telephone number. B. By selecting a BBC or ITV channel on the TV set. C. By using a remote control channel selector. D. By using a keypad.	The answer is 'D'. The keypad is used to control the mode of operation of the TV set and select the required information by pressing numbered buttons.

Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
10 - 16	5. How is specific information on different subjects identified on a teletext system?	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.	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
10 - 16	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?	A. FIVE B. SIX C. SEVEN D. MORE THAN SEVEN	The answer is 'C'. 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.

Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
10 - 16	7. What is the <u>main</u> 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.
17 - 20	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.

Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
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.
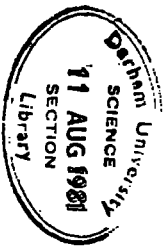
Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
24 – 40	13. Which mode of data transmission is used to transmit data to PRESTEL users?	A. Simplex B. Synchronous C. Asynchronous D. Duplex	The correct answer is 'C', Asynchronous, start/stop transmission is used. Each character 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.

Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
41 - 54	16. Which of the following are mixed-media systems?	A. CYCLOPS B. ORACLE C. TELEDON D. PLATO	The correct answers are 'A', CYCLOPS, and 'D', PLATO.
41 - 54	17. In which University is PLATO being developed?	A. University of Ohio B. University of California C. The Open University D. University of Illinois	The correct answers is 'D', University of Illinois. PLATO is an acronym for Programmed Logic for Automatic Teaching Operation.
41 - 54	18. How can the screen of the CYCLOPS system be accessed?	A. By touch (with the finger) B. By keyboard C. By light pen D. By use of a digitising tablet	The correct answers are 'B', 'C' and 'D'.

Relevant 35mm Slide Nos.	Questions	Multiple Choice Answers	Coursebook Outline
41 - 54	19. In the mixed-media systems described, what is the name of the person responsible for preparing material for transmission to the user?	A. Information provider B. Editor C. Author D. Teletext Controller	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.
41 - 54	20. Who are likely to be the users of teletext systems in the future?	A. Business organisations B. Housewives C. Schools and Colleges D. All of the above	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.

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.

INDEX TO SLIDEFILE - 'TELETEXT SYSTEMS'

* Indicates a colour slide not reproduced in the Guidebook

* Indicates a colour slide not reproduced in the Guidebook

* Indicates a colour slide not reproduced in the Guidebook

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.

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4. Control Data Education Company - PLATO - A New Way to Solve Tough Training Problems, 1979.

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6. Malik, A. and Fedida, S., The Viewdata Revolution, Associated Business Press, ISBN: 0-85227-214-6, 1979.

7. Stokes, A.V., VIEWDATA - A Public Information Utility, Langton Information Systems Series, ISBN: 0-905897-218, 1979.

8. The Prestel Users' Guide and Directory, Vol.2, No.1, January 1979.

9. Read, G.A., CYCLOPS - An Audio-Visual System - A Brief Description, The Open University Press, ISBN: 0-325-000245-5, 1978.

10. Chew, J.R., CEEFAX: Evolution and Potential, BBC Engineering, 1977.

11. Fedida, S. and Dew, B., Viewdata in Education, International Yearbook of Educational and Instructional Technology, 1978/79.

Slides boxed and shelved

with audio-visual material

Thesis

at ++ 1981/YEA

* 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

Slide	Question	Multiple Choice Answer
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 tele-text systems. Do you know the name of the broadcasting authority?	A. The British Broadcasting Authority (BBC) B. The Independent Broad-casting Authority (IBA) C. The Post Office D. The Canadian Broadcasting Authority
3. Flow of Information in a view-data 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 informa-tion 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

	Slide	Question	Multiple Choice Answer
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

Slide	Question	Multiple Choice Answer
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 alpha-numerics 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 view-database 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

	Slide	Question	Multiple Choice Answer
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

	Slide	Question	Multiple Choice Answer
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 <u>major</u> 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

	Slide	Question	Multiple Choice Answer
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 view-data system?	A. A specially adapted 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

	Slide	Question	Multiple Choice Answer
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

	Slide	Question	Multiple Choice Answer
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 <u>major</u> 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

Slide	Question	Multiple Choice Answer
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

	Slide	Question	Multiple Choice Answer
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 tele-text 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 trans-mission 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 illus-trated 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

Slide	Question	Multiple Choice Answer
79. VIEWDATA - Mesh inter-connection at international level	In the future teletext systems will be inter-connected internationally. What are the names of the systems which will connect Canada and France respectively?	A. Antiope B. Telidon C. Videotex D. Captains
80. CYCLOPS - showing modem and keyboard	This system can send infor-mation over a telephone line via a modem. What is this system called?	A. PRESTEL B. CYCLOPS C. PLATO D. SOCRATES