

Avon Einstein User Group

Vol 3 No 3



What is happening
on April 22 ?

The Einstein Show

At

The Birmingham M/C Museum

APRIL 22 .

Dear Members

At the club night on the 9th March it was decided to have a stand at the forth coming Einstein Show on the 22nd April, this stand will have the public domain library (providing Graham remembers the discs) various items for sale, John Nash will be there to answer questions on machine code and Russ Towler will be hopefully there to demonstrate his Cash-Flow program which he also will be selling.

If you have anything to sell or you would like to come along to demonstrate something then let me know at the next club meeting and we can sort out whether we need more than one stand.

THIS COULD BE THE LAST EINSTEIN ONLY SHOW SO PLEASE COME ALONG AND

!!!! SUPPORT IT !!!!

.....

Unfortunatley John Nash has not been able to continue his machine code tutorial this month due to family commitments but hopes to continue it next month.

You may think that the newsletter has been thrown together this month, this is true as I have upgraded to a IBM compatible XT and have been busy trying to understand the inner secrets of MS-DOS, when I have I will try and write something about it ???.

.....

ITEMS FOR SALE

RADIO SHACK (TANDY) DMP 110 PRINTER (centronics).....£80.00

contact.....MIKE MADDOCK.....0272/825076

.....

OLIVETTI DY450 DAISY-WHEEL PRINTER (RS232) complete with lead to connect to the Einstein, spare daisy-wheel, print speed 45cps, full width carriage. VERY QUIET !!!

.....£350.00 o.n.o

5.25 DISK DRIVE, 80 TRACK, DOUBLE-SIDED 780k. complete with ribbon

.....£65.00

POWER SUPPLY FOR ABOVE.....£5.00

BLANK USED DISKS 3".....£1.00 EACH

contact.....BOB SMITH.....0934/517465

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SUPPORT THE EINSTEIN

COME TO THE EINSTEIN SHOW ON THE 22 APRIL 1989

STARTS 10.00 am until 5.00 pm

ENTRANCE FEE ONLY 50p

Don't forget the next club meeting is on the 13th of APRIL

starting at 8.00pm at the

BLACK HORSE, WEST STREET, OLD MARKET, BRISTOL.

PLEASE TRY AND COME

(front cover designed and supplied by M.MADDOCKS. using an SBC XT and FIRST PUBLISHER)

Programming in BASIC for Beginners - Part 3

In part 2 we wrote a short program which displayed a message on the screen. By now you will have noted that once the power has been turned off the computer forgets everything that has been typed in. This is because the RAM requires a constant supply of electricity in order to keep its memory. Any interruption of the power supply, even for a second, results in the erasure of the RAM contents. This presents no problems when we are dealing with a very short program like the one we created in part 2 because they can be easily re-typed when we need them again. However, a practical program is much longer and complex and it is just not practical to retype a program everytime we want to RUN it.

The Disc Drive

What is needed is a backing store of memory !, and this is supplied in the shape of the DISC DRIVE. When we have finished using the computer for today or wish to use it for another task, the contents of the RAM may be recorded or SAVED on a disc. The command used for this is the SAVE command.

The Save Command

SAVE is used in the Direct Mode and is followed by inverted commas (") following the inverted commas is a number which can be either a 0, 1 or 2. This tells the computer which disc drive you want to use, 0 being the left hand internal drive, 1 being the right hand internal drive and 2 being an external drive which plugs into the rear of the Einstein. If this number is omitted the drive which was in previous use is assumed, which is drive 0 on power up. Following the drive number is a colon (:) and then comes the name of the program to be SAVED.

The Program Name

This name is devised by the user and must not be more than eight (8) characters long and must not use the characters .,"<>:=?*, after the program name comes a full stop (.) and then three letters which is known as the FILE EXTENSION which denotes what type of file the program is.

There are four types of files and they are :-

- (a) .XBS which is a BASIC source file (ie. a normal program file). If the File name extension is omitted then .XBS is assumed.
- (b) .ASC indicates an ASCII file and will be dealt with in a later article.
- (c) .OBJ indicates an OBJECT file or machine code subroutine. This to will be dealt with in a later article.
- (d) .COM indicates a COMMAND file. These files can be LOADED and RUN automatically under DOS by simply specifying their name without the FILE name extension. XBAS.COM is a good example of a COM file.

Any other combination of characters specified in the extension will be treated as a DATA file.

DATA files consist of a series of characters which can be accessed by a BASIC program. Following the FILE name extension comes another set of inverted commas.

If we now load XBAS and re-enter our program ie.

```
10 PRINT"ATUNG EINSTEIN"
20 END
```

We are now in the position to SAVE it on a disc.

Saving a Program

Insert a formatted disc in drive 0 (the left hand drive) and type
SAVE"0:PROG1.XBS" <ENTER>

The disc light will illuminate (green, if you are using the A side of the disc or red, if you are using the B side) and after a few seconds the READY prompt will appear on the screen. The program has now been recorded on the disc. To confirm that it is there we may type DIR <ENTER>. This will cause the computer to activate the disc drive and read the directory tracks of the disc, a list of all the files recorded on that disc will be displayed on the screen. Amongst them will be PROG1.XBS.

If we now type NEW <ENTER> our program will be erased from RAM. To confirm this type LIST <ENTER> and instead of seeing a program listing nothing but the READY prompt will appear.

If we now type LOAD"0:PROG1.XBS" <ENTER> the disc will be activated and our program will be LOADED from the disc back into RAM. Once the READY prompt has reappeared we can once again type LIST <ENTER>, this time our program listing will appear on the screen.

The program could have been LOADED using RUN"0:PROG1.XBS" or CHAIN"0:PROG1.XBS" in which case the program would be executed immediately once it had been loaded. The difference between RUN and CHAIN will be explained in a later article.

MODIFIED LISSAJOUS FIGURES

Lissajous figures are the result of plotting one sine wave against another. Modified Lissajous figures arise when the plot is made cyclical, i.e. $P=2\pi + T$, where T is the increment by which the figure is plotted.

The above program is a modification of a program that was in turn modified from a Spectrum program by R. MUKUNDAN of Bangalore, India, that appeared in Popular Computing Weekly, 23 Feb. 1989.

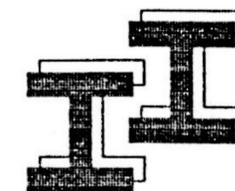
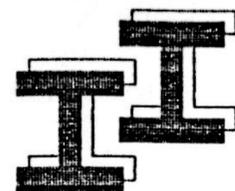
The modified programs and an accompanying short article will possibly be appearing, or may have already appeared, in Einstein Monthly, the U.K.Einstein User Group's magazine, and anyone wishing further details is referred there.

```

10 REM::LISSAJOUS FIGURES CONVERTED FOR THE EINSTEIN :::
20 REM::BY CHRISTOPHER PICKLES, A.E.U.G. NO.051P:::
30 REM::FROM A PROGRAM BY R.MUKUNDAN IN PCW 23 FEB 1989 FOR THE SPECTRUM:::
40 BCOL1:GCOL15,1:TCOL15,1:CLS32
50 PRINT@1,10,"INPUT VALUE FOR X (1-20):-";:INPUT U
60 PRINT@1,12,"INPUT VALUE FOR Y (1-10):-";:INPUT V
70 CLS
80 GOSUB260
90 F=0
100 FOR X=1 TO U
110 FOR Y=(1+X) TO (V+X)
120 GOSUB260
130 T=0:P=2*PI+0.03:F=F+1
140 PRINT@10,22,"Figure No.";F
150 M=0:N=0:ORIGIN 127,98
160 I=120*SIN(X*T)*SIN(T)
170 J=75*SIN(Y*T)*COS(T)
180 I=INT(I):J=INT(J)
190 DRAW M,N TO I,J
200 M=I:N=J:T=T+0.03
210 IF T<P THEN GOTO 160
220 FOR D=0 TO 2500:NEXT D
230 CLS:NEXT Y
240 NEXT X
250 GOTO 40
260 PRINT@7,0,"LISSAJOUS FIGURES"
270 PRINT@7,1,"1111111111111111":REM:::UNDERLINE USING GRAPH 1:::
280 RETURN

```

DBASE DBASE



Hi there

Having read parts 1 & 2 of DBASE 2 by MICK PUGH (G4VPD) "C.D.M and BAR"-(milk bar of course).....sorry for the mick-ey take MICK !! (hope I dont bump into him at an " EINNY EXHIBITION " . I will make up for my cheek by saying the articles were good enough to get me interested and to start me of on DBASE 2 .

So having followed the step by step directions from Micks article I quickly created :

THE FILE: ADDRESS.....

and the

RECORD STRUCTURE : as shown by Mick

I then entered some data in to the "record " wonderful no "probs" so farI dont no if I can pad this out any longer ! I then decided to play around a bit my self my example was as follows .

THE FILE: ADDRESS

RECORD STRUCTURE :

FIELD.	NAME.	TYPE.	WITH.	DEC PLACES
001	NAME,	C	30	
002	ADRS,	C	30	
003	ADRS1,	C	30	
004	ADRS2,	C	30	
005	CNTY,	C	30	
006	PSCD,	C	30	
007	TEL,	C	30	

So my record was as follows .

REC NO 00001

```

NAME :MIKE IVORY
ADRS :1 HEATH ROAD
ADRS1 :HANHAM
ADRS2 :BRISTOL
CNTY :AVON
PSCD :BS15 3JT
TEL :616281

```

I did find out during this exercise that you had to identify each field differently - "dam obvious really " people can be so stupid can't they , how else would you be able to search by particular fields .

I must admit by now I was wondering what some of the other terms meant in the display: NAME. TYPE. WIDTH. DEC PLACE. ?.

So I found out....

NAME : SELF EXPLANATORY - AS I HAVE SHOWN
TYPE : ? YOU CAN ENTER ONE OF THESE

"C" =CHARACTER (ANYTHING NAMES ADDRESSES ,DESCRIPTIONS
"N" =NUMERIC (MATHS AND MONEY ETC.)
"L" =LOGICAL (ONLY ALLOWS T/Y(TRUE) OR F/N(FALSE)

WIDTH :THIS IS THE LENGTH OF THE FIELD
if you use a character field the length can be from 1-254 .

This has to be good for welsh names- Llan.....gogo

DEC PLACES : DECIMAL PLACES.
(not too sure how this is used ?.)

I did manage to do a few other things as well...

OPEN/CLOSE FILES
ADDED and EDITED DATA
DELETED DATA and FILES .

Well I think I will close THIS file for now , my thanks again to Mick P. all I want now is some one out THERE to tell ME what I can use it for.

The DBASE 2 HEADING was done with 3s GRAF DRAW 2 , maybe "BOB", I might review that for you one day thats if they have not brought out G.D. 3 by then .

Thats it for this year then
BYE from Mike Ivory

EDITORS NOTE.....Just show's you don't read the newsletters !, Vol.3 No.1 had a review of Graph Draw 2 by S.Huxley in it. Also if you want to learn more about Dbase II then I can recommend a book called "WORKING WITH DBASE II by M.de Pace", published by "BSP Professional BOOKS" and costing £9.95, this book is also available at your Public Library.

* * * * * SUPASOFT * * * * *

CASH TRADER	Multi-choice, Multi-player Trading Game	£7.50
EAZIDRAW	Versatile Printed Circuit Board Designer	£12.50
SUPASHAPE	Shape/Sprite Design Suite with Library	£9.50
THE I CHING	Chinese Divination + Book	£9.50
SUPAPLAY	Nine Game Compendium	£7.50
SUPADISC	SUPAMATH + SUPAMECH + BANKMAN	£15.50
	SUPAMATH + SUPAMECH	£13.50
	SUPAMATH + BANKMAN	£11.50
	SUPAMECH + BANKMAN	£11.50
SUPAMATH	Maths tutorial and demonstration	£9.50
SUPAMECH	Mechanical Engineering tutorial	£9.50
BANKMAN	34 K. of financially oriented programs	£6.50

* * * * * SECONDHAND * * * * *

MUSIC WORKSHOP	On screen composition and playback	£8.00
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* * * * * NEW * * * * * FREE * * * * *

SUPACOMP Send a formatted 3" disk in a padded envelope, complete with return postage and receive this menu driven selection of 54 XBASIC programs free of charge. Topics covered include Mathematics, Statistics, Electrical Engineering, Physics and Surveying.

SUPACOMP is, and can be, freely distributed on the understanding that it is in no way altered and that it retains its copyright at all times.

Those finding the compilation of use, or interest, and who would like further information on the various topics contained therein can register their copy by sending a cheque, or postal order, made payable to SUPASOFT, to Chris Pickles at the address given below. They will then be sent a copy of the SUPACOMP data book containing background information, including diagrams, pertaining to the various programs used in the compilation.

The main menu is divided into 5 sections:-

Mathematics / Electrical Engineering / Statistics / Physics, Chemistry and Medicine / Navigation and Surveying,

with each section loading seperately, as a single entity and containing at least 10 sub-topics.

* * * * *

All prices include postage and all orders and enquiries should be addressed to SUPASOFT, c/o Chris Pickles, 474 Hertford Road, Edmonton, London N9 8AD.

PRODUCT NEWS

In Vol.2 No.10, I told you about a disc storage unit for 3" discs and since then I have had a letter from S.Gibbs with further information on these units. The firm to get these from is :-

MICRO-MEDIA, FREEPOST (dept. CA3), UNIT 3, CUTTERS CLOSE, NARBOROUGH, LEICESTER, LE9 5FZ. Tel.No.0533/858654 (Between 8.30am - 6.30pm), out of those hours there is an answering machine.

If you wish to order it is....ORDER CODE B209 and the prices are :-

1 = £11.90, 3+ = £11.30, 6+ = £10.50, 12+ = £9.95, 24+ = £9.50.

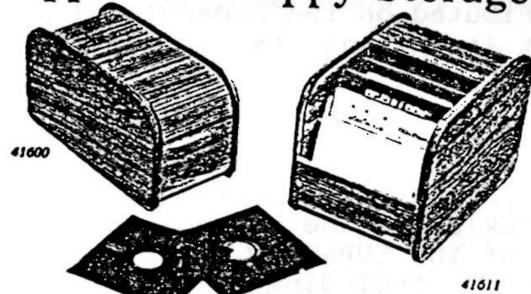
Stan is very satisfied with this product infact I will quote from his letter, "I ordered them by freepost letter on monday the 6th March, as you know 'freepost' is treated as third class mail so I doubt if my order reached the firm before thursday. Anyway I received the disc boxes by parcel post on monday the 13th March. I think this is pretty good service".

Also on the product line, I came across a company based in Bristol which also has given me very good service, the companys name is :-

CompuAdd, CLIFT HOUSE ROAD, ASHTON GATE, BRISTOL, BS3 1RX, Tel.No. 0272/637488 or Free Phone 0800/373535

Obviously this firm deals with 16 bit Micro's but below is a sample of some of their products which would be suitable for our application.

Floppies ... Floppy Storage



Take full measures to protect your floppies.

File boxes for 5.25" floppies. Holds 50 floppies, without lock. 41610 - £6

Holds 100 floppies, with lock. 41615 - £8

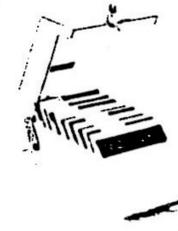
Holds 120 floppies, with lock. 41616 - £10

Teak disk file for 50 5.25" diskettes. 41611 - £14

File boxes for 3.5" floppies. Holds 40 floppies, without lock. 41598 - £6

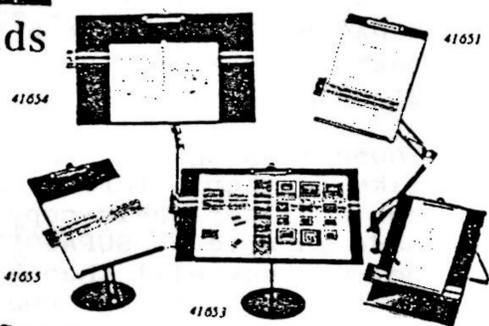
Holds 80 floppies, with lock. 41599 - £8

Teak disk file for 45 3.5" diskettes 41600 - £10
Cases for 5.25" floppies. Holds 10 floppies. 41576 - £2
Holds 6 floppies. 41577 - £1
Case for 3.5" floppies. Holds 10 floppies. 41575 - £2
Portable carry-case with lock and handle for 5.25" floppies. Holds 120 floppies. 41617 - £20



Floppies packaged 10 to a box.
5.25" Floppies
360KB DS/DD. 57000 - £3
1.2MB DS/HD. 57200 - £8
3.5" Floppies
720KB Sony® DS/DD. 57401 - £14

Stands

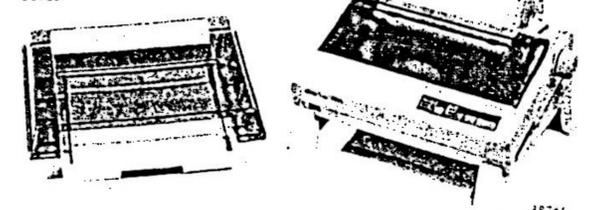


Copy Stands

48.3cm x 30.5cm Copy holder with stand. 41653 - £13
48.3cm x 30.5cm Copy holder with adjustable arm. 41654 - £16
42.1cm x 27.9cm Copy holder with stand. 41650 - £9
42.1cm x 27.9cm Copy holder with adjustable arm. 41651 - £10
42.1cm x 27.9cm Copy holder with stand. 41655 - £10

Printer Stands — Stop fussing about with untidy paper.

Universal printer stand is made of sturdy plastic and holds any size printer. (30.4cm - expands to 50.1cm) x 30.4cm. 38760 - £5
Multifunction printer stand for 80-column printer with under-printer drawer (plastic). 38765 - £13



```
10 REM ***** MARVIN *****
20 REM BY E.A.PARR 1980.
30 REM Typed in and modified by
40 REM C.Martin March 1989.
50 DIM S(99)
60 FOR I=0TO99:S(I)=999:NEXT I
70 S=0:R=0:I=0
80 REM MENU SELECTION
90 CLS:PRINT@1,0;"*** Written by E.A.Parr july 1980. ***"
100 PRINT@9,4;"*****";PRINT@9,8;"*****"
110 PRINT@9,6;"***** MARVIN! *****";PRINT@1,2;"???? computer register
    simulator. ????"
120 PRINT@8,10;"CONTROL FUNCTIONS ARE:-"
130 PRINT@12,12;"L. LOAD.":PRINT@12,13;"M. MODIFY.":PRINT@12,14;"
    S. SINGLE STEP.":PRINT@12,15;"R. RUN."
140 PRINT@12,16;"E. EXAMINE.":PRINT@12,17;"T. TERMINATE.":PRINT@9,19;"
    *** I. INSTRUCTIONS ***"
150 PRINT:INPUT" WHICH DO YOU REQUIRE ? ";AS
160 BS=LEFT$(AS,1)
170 IF BS="L" GOTO250
180 IF BS="M" GOTO430
190 IF BS="S" GOTO580
200 IF BS="R" GOTO660
210 IF BS="E" GOTO1160
220 IF BS="T" GOTO1300
230 IF BS="I" THENGOSUB1390
240 GOTO80
250 REM ** LOAD **
260 CLS
270 PRINT@3,2;"YOU CAN LOAD A PROGRAM FROM ANY"
280 PRINT:PRINT@6,4;"LOCATION, TYPE T AS DATA"
290 PRINT@9,6;"TO RETURN TO MENU !"
300 PRINT:INPUT" START LOCATION ";AS:N=VAL(AS)
310 IF N<=99 AND N>=0 GOTO330
320 PRINT:PRINT" INVALID LOCATION";BEEP5:GOTO300
330 PRINT:INPUT" DATA ";AS:PRINT
340 IF LEFT$(AS,1)="T" GOTO80
350 D=VAL(AS)
360 IF D<=999 AND D>=0 GOTO380
370 PRINT" INVALID DATA";BEEP5:GOTO330
380 S(N)=D
390 N=N+1
400 IF N=100 GOTO80
410 PRINT" LOCATION ";N;" ";
420 GOTO330
430 REM ** MODIFY **
440 CLS
450 PRINT@3,2;"YOU CAN MODIFY ONE LOCATION, TYPE"
460 PRINT@5,4;"L AS DATA TO LEAVE UNCHANGED":PRINT:PRINT
470 INPUT" LOCATION ";AS:N=VAL(AS)
480 IF N<=99 AND N>=0 GOTO500
490 PRINT:PRINT" INVALID LOCATION";BEEP5:PRINT:GOTO470
500 PRINT:PRINT" CURRENT DATA ";S(N)
510 PRINT:INPUT" NEW DATA ";AS:PRINT
520 IF LEFT$(AS,1)="L" GOTO80
530 D=VAL(AS)
540 IF D<=999 AND D>=0 GOTO560
550 PRINT" INVALID DATA";BEEP5:GOTO510
560 S(N)=D
570 GOTO80
```

```

580 REM ** SINGLE STEP **
590 CLS:PRINT@8,2;"##### SINGLE STEP #####"
600 PRINT:PRINT:INPUT"          EXECUTION TO START AT ";AS:I=VAL(AS)
610 IF I<=99 AND I>=0 GOTO630
620 PRINT:PRINT"          INVALID LOCATION":BEEP5:GOTO600
630 S=1:SK=0
640 PRINT:PRINT:INPUT"          MONITOR REQUIRED ? Y/N ";AS: IF AS="Y"
    THEN SK=1:PRINT:PRINT
650 GOTO730
660 REM *** RUN ***
670 CLS:PRINT@1,0;"TO STOP RUN PRESS BUTTON ON JOYSTICK 1.":PRINT@10,2;
    "##### RUN #####"
680 PRINT:INPUT"          EXECUTION TO START AT ";AS:I=VAL(AS)
690 IF I<=99 AND I>=0 GOTO710
700 PRINT:PRINT"          INVALID LOCATION":BEEP5:GOTO680
710 S=0:SK=0
720 PRINT:PRINT:INPUT"          MONITOR REQUIRED ? Y/N ";AS: IF AS="Y"
    THEN SK=1:PRINT:PRINT
730 F=INT((ABS(S(I)))/100):X=ABS(S(I))-100*F:IF BTN(0)=0 THEN 1100
    ELSE740
740 IF SK=0 GOTO760
750 PRINT          I,S(I),R:IF BTN(0)=0 THEN 1100ELSE 760
760 IF S=0 GOTO780
770 GOSUB1150
780 ON F+1GOTO950,990,860,890,800,830,1070,920,1040
790 GOTO1100
800 REM *** FETCH ***
810 R=S(X)
820 GOTO1110
830 REM *** STORE ***
840 S(X)=R
850 GOTO1110
860 REM *** ADD ***
870 R=R+S(X):IFR>999 OR R<-999 GOTO1090
880 GOTO1110
890 REM *** SUB ***
900 R=R-S(X):IFR>999 OR R<-999 GOTO1090
910 GOTO1110
920 REM *** JUMP NEG ***
930 IF R<0 GOTO1070
940 GOTO1110
950 REM *** INPUT ***
960 BEEP:INPUT" [][[ INPUT DATA [][[ ";AS: S(X)=VAL(AS)
970 IFS(X)>999 OR S(X)<-999 GOTO1090
980 GOTO1110
990 REM *** OUTPUT ***
1000 IF S(X)>=900 GOTO1020
1010 PRINT" ]]]]]]]]] OUTPUT DATA ]]]]] ";S(X):BEEP:GOTO1110
1020 REM *** ALPHA OUTPUT ***
1030 PRINT CHR$(S(X)-869);:GOTO1110
1040 REM *** JUMP ZERO ***
1050 IF R=0 GOTO1070
1060 GOTO1110
1070 REM *** JUMP ***
1080 I=X:GOTO730
1090 BEEP5:PRINT:PRINT:PRINT"          *** OVERSPILL ***":FORO=OTO1500:
    NEXT
1100 BEEP2:PRINT@0,22;"          TERMINATED AT ";I:PRINT@8,23;"PRESS
    ENTER FOR MENU!":INPUT Y$:IFY$="Y" THEN 80ELSE 80
1110 REM *** INC PC ***

```

```

1120 I=I+1
1130 IF I=100 THEN PRINT"          ????? HALTED AT 100 ?????":BEEP3:
    FORH=OTO2000:NEXT:GOTO80
1140 GOTO730
1150 PRINT:INPUT"          CONTINUE":AS: RETURN
1160 REM *** EXAMINE ***
1170 CLS:PRINT@11,0;"##### EXAMINE #####"
1180 PRINT@4,2;"YOU CAN EXAMINE THE STORE FROM ANY"
1190 PRINT@3,4;"LOCATION,TYPE (T) TO RETURN TO MENU,"
1200 PRINT@9,6;"OR HIT ENTER TO CONTINUE,"
1210 PRINT@12,8;"WITH NEXT LOCATION !"
1220 PRINT:INPUT"          START LOCATION ";AS:N=VAL(AS):PRINT
1230 IF N<=99 AND N>=0 GOTO1250
1240 PRINT"          INVALID LOCATION":BEEP5:GOTO1220
1250 PRINT"          LOCATION ";N;" DATA";S(N)
1260 PRINT:INPUT"          NEXT ";AS
1270 IF LEFT$(AS,1)="T" GOTO80
1280 N=N+1:IFN=100 GOTO80
1290 GOTO1250
1300 REM *** TERMINATE ***
1310 CLS:PRINT@2,7;"IF YOU TERMINATE YOU WILL RETURN TO"
1320 PRINT@1,9;"BASIC AND LOSE YOUR PROGRAM IN MARVIN"
1330 PRINT:INPUT"          DO YOU STILL WISH TO TERMINATE ?":AS
1340 IF AS="Y" GOTO1360
1350 GOTO80
1360 PRINT:PRINT"          THANK YOU FOR YOUR PROGRAM"
1370 PRINT:PRINT"          BYE":FORB=OTO2000:NEXT:CLS:DIR:END
1380 REM *** INSTRUCTIONS ***
1390 CLS:PRINT"          ***** MARVIN INFORMATION *****":PRINT
1400 PRINT"          THE FOLLOWING ARE NEEDED TO          OPERATE &
    UNDERSTAND THE PRINCIPLE          BEHIND MARVIN'S USE!
1410 PRINT
1420 PRINT"          * INSTRUCTIONS & FUNCTIONS ARE:- *":PRINT:PRINT:PRINT
1430 PRINT"          INSTRUCTION          FUNCTION"
1440 PRINT
1450 PRINT"          0          INPUT TO STORE
    LOCATION (N).
1460 PRINT
1470 PRINT"          1          OUTPUT (print) FROM
    STORE LOCATION (N).
1480 PRINT
1490 PRINT"          ADD CONTENTS OF STORE          2
    LOCATION (N) TO          ACCUMULATOR.
1500 PRINT
1510 PRINT"          SUBTRACT CONTENTS OF          3
    STORE LOCATION (N)          FROM ACCUMULATOR.
1520 PRINT
1530 PRINT"          FETCH CONTENTS OF          4
    STORE LOCATION (N)          TO ACCUMULATOR.
1540 PRINT
1550 PRINT"          STORE CONTENTS OF          5
    ACCUMULATOR IN          LOCATION (N).
1560 PRINT
1570 PRINT"          6          JUMP TO INSTRUCTION
    AT LOCATION (N).
1580 PRINT
1590 PRINT"          7          JUMP IF ACCUMULATOR
    IS NEGATIVE.
1600 PRINT
1610 PRINT"          8          JUMP IF

```

```

ACCUMULATOR ZERO.
1620 PRINT
1630 PRINT"                (the value)          9
      STOP! (of (N) is)          (irrelevant)
1640 FORW=OTO2000:NEXT:CLS
1650 PRINT" The addresses (00-99) are filled with      a 3 digit
      number (000-999).
1660 PRINT
1670 PRINT" The 3 digit number can be considered      as being in 2
      parts, each can be          thought of individually.
1680 PRINT
1690 PRINT" Example 606:- the 1st digit 6 is      the jump to
      instruction, the 2nd      & 3rd are the address to jump to.
1700 PRINT
1710 PRINT" Therefore the number 606 will tell"
1720 PRINT" the program counter to jump to the      address 06 and
      continue from there.
1730 PRINT
1740 PRINT" Therefore the program can consist      of 100
      instructions made up of      100 three digit numbers."
1750 FORW=OTO2000:NEXT:CLS
1760 PRINT"      THE PROGRAMME VARIABLES          ARE AS FOLLO
WS:--"
1770 PRINT
1780 PRINT"      I program counter
1790 PRINT"      R accumulator contents
1800 PRINT"      S array store locations
1810 PRINT"      A$ input strings
1820 PRINT"      B$ truncated input strings
1830 PRINT"      D input data
1840 PRINT"      N input locations
1850 PRINT"      S single-step marker
1860 PRINT"      SK marker if monitor required
1870 PRINT"      F function part of instruction
1880 PRINT"      X address part of instruction":PRINT@4,22;"*****
      RETURNING TO MENU! *****"
1890 FORW=OTO2000:NEXT:CLS:RETURN

```

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