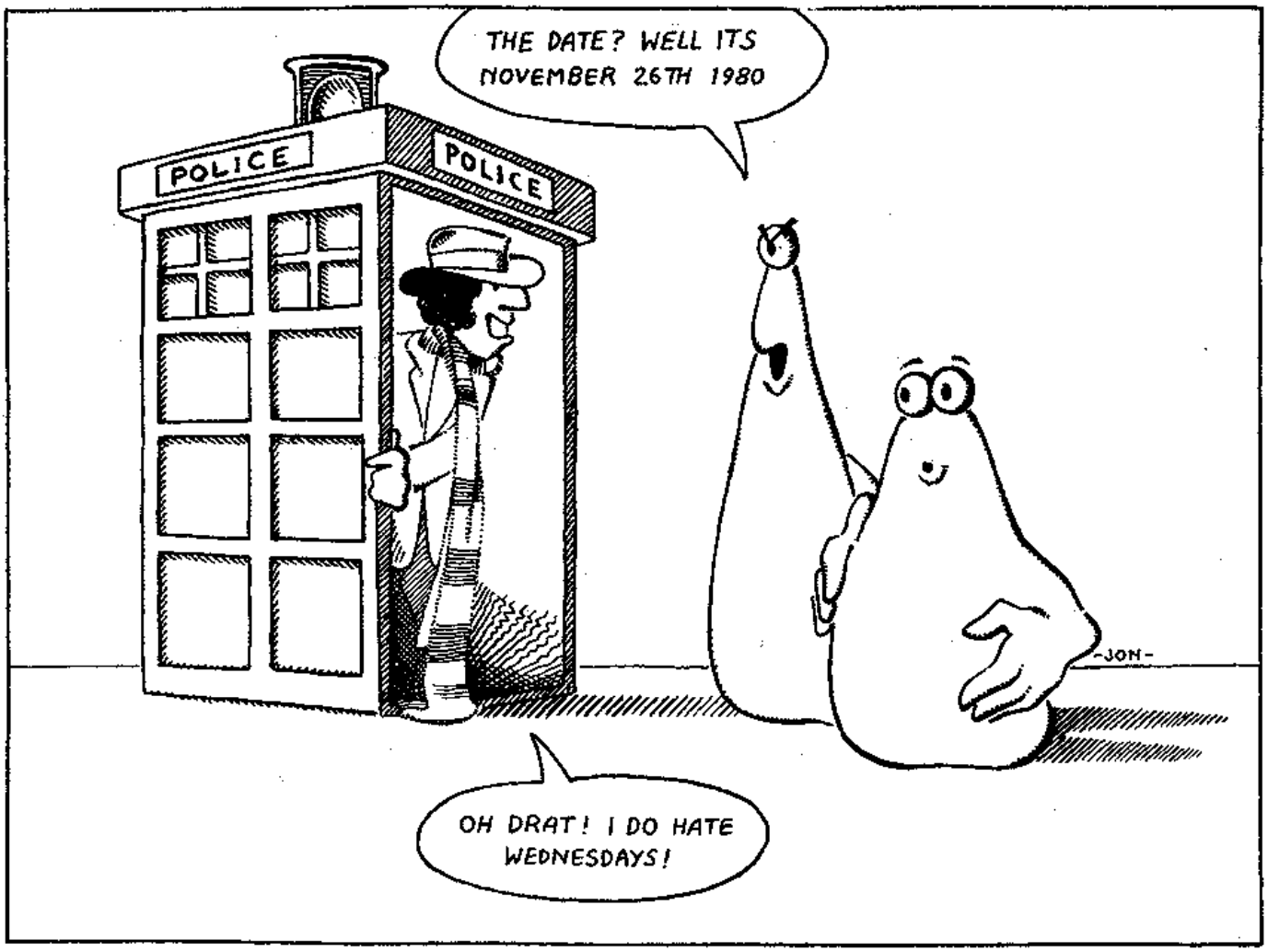
Vol 3 – No 12. August 1990.

FORMAT

FOR SPECTRUM AND SAM USERS



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CONTENTS

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NEWS ON 4

SAM COMPUTERS LTD.

Bruce Gordon and Alan Miles, co-founders of MGT, have now formed a new company called SAM Computers Ltd or SAMCO for short. The new company will provide support for existing SAM Coupé owners by providing an ongoing warranty service and hardware/software for the machine.

Most importantly for existing users SAMCO will be setting up a warranty repair service details of which will be mailed to registered SAM owners in the next week or so. Also included in this mail-out will be details of the new ROM/DOS upgrade kits which will be available for £12 including postage and packing.

Alan Miles stressed that the new company would not be acting alone. "What we are trying to do is to create a kind of 'TEAM SAM' where a number of separate companies and individuals give their support for SAM and work in loose association towards making the SAM Coupé a success". Already several companies have pledged support including Format; Chezron; Enigma Variations; PBT Electronics; and Hollington Meyers.

The new address for SAM Computers Ltd is 7 Cleavedon Court, Uplands, Swansea, SA2 0RG. Phone number to be announced.

PLUS D/DISCiPLE REPAIRS

Paul Thomas has started a new repair service for PLUS Ds and DISCiPLEs that give up the ghost. Paul, who was for a long time responsible for repairs at MGT has formed a new company called PBT Electronics. As well as offering a repair service for the two interfaces Paul will also be selling the SAM Coupé by mail order along with many extras for SAM and Spectrum owners.

PBT can be contacted on 0639-885008 or see advert in this issue.

SD SOFTWARE TAKE ON UNI-DOS

SD Software of Falkirk have taken on the new DISCiPLE/PLUS D operating system UNI-DOS writen by Steven Warr. The new DOS will be available in September and will replace the ROM and SYSTEM file in both interfaces.

UNI-DOS is much more powerful than the existing GDOS and G+DOS systems providing Random Access files, Sub Directories and lots more. It also preserves the simple command syntax od the DISCiPLE and PLUS D while adding many new features to the disc system.

Full details next month.

NEW ASSEMBLER FOR PLUS D/DISCiPLE

Bradway Software have now launched a PLUS D and DISCiPLE version of their ASTRUM+ assembler package. The new program contains many features that exploit the power of the disc systems. It allows the user to use several pre-defined Macro commands that ease the development of programs.

ASTRUM+ is available for £14.50 (incl p&p) from Bradway Software, Hillsett, Upper Padley, Grindleford, Sheffield, S30 1JA.

BETTERBYTES PLAN NEW RELEASES

Long running DISCiPLE and PLUS D software company Betterbytes will be launching at least two new products in September. Both products are disc utilities which will work on either disc system.

Dave Hood, owner of Betterbytes told Format "I have been working on these utilities for some months now. Betterbytes Software will continue to produce DISCiPLE and PLUS D software for as long as people ask for it."

For further details send a stamped addressed envelope to:- Betterbytes, 10 Spittal Terrace, Gosforth, Newcastle Upon Tyne, NE3 1UT.

SAM NEWS-LINE

Bruce Everiss has set up a telephone News-Line for the SAM Coupé. Weekly from Monday 6th August SAM owners can dial 0890-299380 for the latest news and tips on their favourite computer. Messages will be recorded by Alan Miles and Bruce Gordon. Calls are charged at 25 pence per minute cheap rate (6pm to 8am) or 38 pence per minute at other times.

SAM VOICE SYNTHISISER

A new Swansea based company Blue Alpha Electronics have just announced a Voice Synthisiser for the SAM Coupé. Priced at £29.95 the Synthisiser will make its public debut at the All Formats Show in London on the 1st September.

Blue Alpha boss Adrian Parker said "This is the first of a range of add-ons we have planned for the SAM Coupé. There are lots of applications, from education to business to games, where having your computer talk to you would be much better than reading things on the screen."

More details from Blue Alpha ElectronicsYnysforgan Farm, Morriston, Swansea, SA6 6QL.

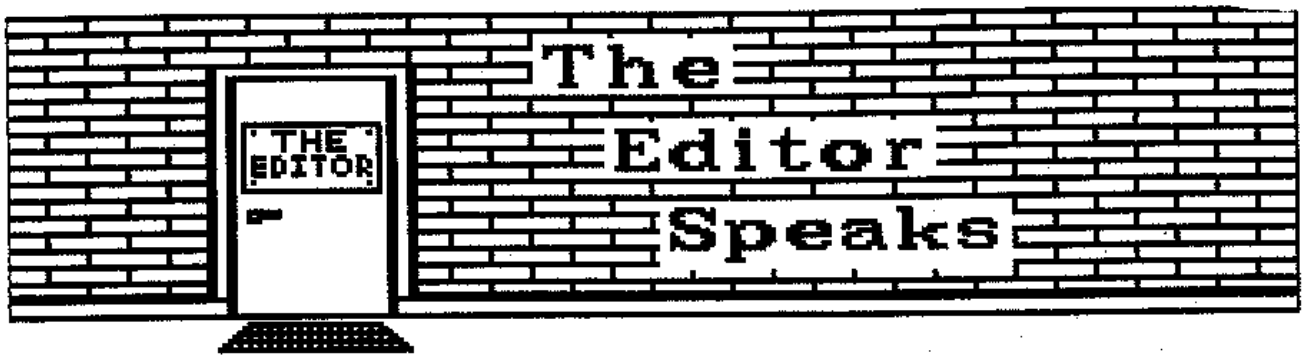
HACKERS HANDBOOK STOPS

The 'Computer Misuse Act' has claimed it's first victim even before becoming law on the 29th August.

Publication company Century Hutchinson has ceased publication of THE HACKERS HANDBOOK. Having sold over 150,000 copies in it's four editions the book is probably the most successful selling computer book ever. It has been withdrawn because, under the new act, even incitement to hack is an offence.

Peter Sommer, who wrote the book under the pen-name Hugo Cornwall, has ruled out rewriting the book to get round the wording of the act. The book may therefore soon become a collectors item as there are believed to be only a few hundred copies left on booksellers shelves and even those may be removed by shops before the end of August.

URGENT we need your news. Clubs, Shows, New Releases, anything you think other people should know about. If you have any news items you want to pass on then send them in. Please mark the envelope NEWS in the top corner.



Well things seem to be sorting themselves out down in Swansea at the moment. The new sales and support company that has been formed by Alan and Bruce will be writing to existing SAM users in the next few weeks with details of the new warranty repair service and other news of SAM developments. From next month there will be a special SAM UPDATE page in FORMAT. This will be written by Alan Miles and will contain all the news of new SAM hardware and software releases. This months news column has lots more information as you will already have read - if you read FORMAT in page number order that is.

I have had a few letters of complaint from Spectrum owning readers about the lack of new software for their machine. "Has everyone turned to SAM?" is a common question. Well there has been a dirth of serious Spectrum software for several years, but signs are that things may be picking up. SD Software, Betterbytes and Bradway Software are all launching new items in the next few weeks. Older companies that pulled out of the Spectrum market could also be encouraged back if they know there is a demand. Only you, the purchaser of software, can keep the demand going. Write to companies, tell them what you want, and we may see more titles being released.

There seems to be some confusion amoungst readers about the user group INDUG. Now as those of you who have been reading FORMAT since the early days will know INDUG was originally the INdependent Disciple User Group. This was formed by yours truly in May 1987, it's aims were to support users of the then new-fangled device called the DISCiPLE. We had a loose association with Miles Gordon Technology and Rockfort Products (who then marketed the DISCiPLE for MGT) and had the official blessing of both in forming the group. In August 1987 the first issue of FORMAT was mailed out as the clubs news-letter. When the PLUS D was launched by MGT we naturaly took this on board and offered support to it's users. As time went by other Spectrum users come along, even though they didn't own a disc system they still valued FORMAT as the last out-post for serious Spectrum users.

FORMAT turned from a news-letter into a magazine and widened it's horizons to cover all things Spectrum. In October 1989 I desided to rename my operation FORMAT Publications. This was done to reflect the wider range of publishing activities I had planned including books and software. It was also done to prevent me needing to rename the user group The INdependent Disciple, Plus D, Spectrum and SAM Coupé Users Group (try getting that on a letterhead). INDUG still exists, although I now just term it the INDependent User Group. Everyone who received FORMAT is an INDUG member, the two are indivisible. It is sometimes helpful for me to plug INDUG in other magazines, the glossies may not like plugging a rival publisher but a user group is looked at in a different light. So thats the story, I hope new readers will now understand the connection between INDUG and FORMAT.

Next month sees the start of VOLUMN FOUR of FORMAT. Don't miss it.

Until next month,

Bob Brenchley. Editor.

SHORT • SPOT

By:- John Wase.

FORMAT extends greetings to Hungary! Istvan Ordog of Budapest writes to tell us he has a (much modified) 48K Spectrum with a PLUS D, two 3.5" drives and a Citizen 120D printer. Istvan mentions thqt he has enlarged the memory to 80K, and that in the original case there's a real -time clock with back-up batteries, based on an idea from "Electronics and Computing", April 1984. Why not send in a complete article explaining exactly how you've done this; Istvan? Then we can publish it in "Format". Personally, I'd love to have a clock: (it would make data gathering from experiments so much easier).

But I digress: Istvan says his letter was nearly ready when the May FORMAT arrived with Rusty Atkins "CATPROG", very similar to the routine that Istvan was working on. However, Istvan claims his program is better, because it's shorter, shows only snapshots, Basic or auto-running code, and therefore never runs out of screen space. Moreover, as loading is by "P-number", there is no problem in loading snapshots. Here it is. I'll let you, the readers, judge...

```
  5 REM ********CATLOAD********
 10 REM ****BY ISTVAN ORDOG****
 15 REM ********HUNGARY********
 20 REM ******1990.02.28*******
 30 LET SOR=3: LET TAB=0: LET KEY=0:
    PAPER 0: BORDER 0: INK 7: CLS
 40 PRINT #1;AT 0,0; INVERSE 1;"
          PLUS D LOADER          "
 60 GOSUB 1000: LET TAB=0
 70 PRINT #1;AT 1,0; BRIGHT 1;"  MOVE
    CURSOR AND PRINT ENTER"
 95 PAUSE 20
100 PRINT AT SOR,11*TAB; OVER 1; BRIG
    HT 1; FLASH 1;"  "
130 LET KEY=CODE INKEY$
140 IF KEY  THEN PRINT AT SOR,11*TAB;
    OVER 1; FLASH 0;"   "
150 LET SOR=SOR+((KEY=54 OR KEY=10) A
    ND SOR<21)-((KEY=55 OR KEY=11) AN
    D SOR>2)
155 LET TAB=(TAB+(KEY=9 AND TAB<2)-(K
    EY=8 AND TAB>0))
160 IF KEY=13 THEN LET KEY=34: GOSUB
    200: LOAD P(VAL L$)
190 PAUSE 20: GOTO 100
200 LET L$="": LET T=11*TAB
220 FOR S=T TO T+1
230 LET S$=SCREEN$ (SOR,S)
232 LET L$=L$+S$
240 NEXT S
260 LET KEY=0
270 PAUSE 50: RETURN
1000 REM LIST OF BASIC FILES, AUTORUN
     CODEFILES AND SNAPSHOT FILES
1010 GOSUB 1070: PRINT AT 3,0;
1020 FOR P=1 TO 80: IF PEEK M1=1 OR PE
     EK M1=5 OR (M1=4 AND PEEK (M1+218
     )+256*PEEK (M1+219)<>65535 AND PE
     EK (M1+218)+256*PEEK (M1+219)<>0)
      AND PEEK M1<>0 THEN PRINT TAB TA
     B;(" " AND P<10);P;" ";: FOR N=1
     TO 7: PRINT CHR$ PEEK (M1+N);: NE
     XT N: LET TAB=TAB+11: IF TAB>22 T
     HEN LET TAB=0
1030 LET M1=M1+256: NEXT P: PRINT
1040 RETURN
1070 REM READING CAT
1080 LET M=30000: FOR T=0 TO 3: FOR S=
     1 TO 10: LOAD @1,T,S,M: LET M=M+5
     12: NEXT S: NEXT T
1100 IF PEEK 30009>32 THEN LET C$=CHR$
      PEEK 30008+CHR$ PEEK 30009
1110 IF PEEK 30009=32 THEN INPUT "ENTE
     R DISC NUMBER "; LINE C$
1130 PRINT TAB 10; BRIGHT 1;"DISC.NR:"
     ;C$: PRINT
1140 LET TAB=0: LET M1=30000: RETURN
9997 STOP
9999 SAVE D*"AUTOLOAD" LINE 1: STOP
```

A few small points. Be careful not to omit the crucial, but oddly numbered line 232: when typing in the program, I did. (That's why I entreat readers to send disc or tape; no errors and takes me a lot less time). And do be careful about Istvan's use of TAB as a variable (that is, typed

out as separate letters, not as a keyword). This is a bit naughty, as he also uses it as a genuine function, firstly in line 1130, and, more confusingly, in the mammoth line 1020, where he uses PRINT TAB TAB;. The first TAB is the function, the second is a variable. Incidentally, I looked at this before I began, and entered it in 48K mode: those with a 128K machine are likely to have fun when the full screen editor gets hold of TAB, for it won't let you use this as a variable. Nevertheless, I can vouch for it that the program works extremely neatly. Congratulations, Istvan.

Those who have used Andy Wright's Beta Basic will probably be familiar with his USING keyword. For instance, PRINT X, USING "###.##" will print all the decimal points in a neat column. Alas, USING is not available in the Spectrum. Those with SAM will have found it as a keyword, but again, alas, there wasn't enough room in the ROM to implement the associated code. Here is the Hungarian solution, again from Istvan....

```
   1 REM ******"USINGPROG"******
   2 REM *ISTVAN ORDOG, HUNGARY*
  10 REM  INPUT Z=NUMBER
  20 REM OUTPUT Q$ WITH 2 DECIMALS
2340 IF O$="." THEN GOTO 2570
2500 LET I$=STR$ Z
2510 LET L=LEN I$
2520 FOR N=1 TO L
2530 LET O$=I$(N TO N)
2540 IF O$="." THEN GOTO 2570
2550 NEXT N
2560 LET I$=I$+".00"
2570 IF N=L-2 THEN GOTO 2590
2580 IF N=L-1 THEN LET I$=I$+"0"
2590 DIM Q$(12)
2600 LET Q$(13-LEN I$ TO )=I$
2610 RETURN
```

I was hoping that this would be a nice lead in to a program I received from Damian Tull; a simple, but quite fast routine to print a decimal number of any size. However, when I came to look at it, it's a microdrive file on disc which apparently loads into the GENS assembler. Like (I suspect) the majority of readers, I haven't a GENS assembler, and I can't get the file to

```
 210 LET T=PEEK 60510: LET S=PEEK 605
     11
 220 LET COUNT=COUNT+1
 230 IF ((T>3 AND T<80) OR (T>127 AND
      T<208)) AND (S>0 AND S<11) THEN
      GOTO 190
 240 IF SIZE<COUNT THEN PRINT #C; FLA
     SH 1;COUNT-SIZE;" EXTRA SECTOR (
     S) FOUND."
 250 IF SIZE>COUNT THEN PRINT #C; FLA
     SH 1;SIZE-COUNT;" SECTOR (S) SHO
     RT."
 260 INPUT ,: REM prevent scroll mess
     age.
 270 NEXT P
 280 STOP
9999 SAVE "SECTOR-MAP" LINE 1
```

Now back to the Spectrum. A. Watt of Aberdeen has modified "Spectral Writer" to run quite nicely on the PLUS D. This is an improved version on the original pokes supplied by Harold Burton of Edinburgh, who used to write frequently (how have I offended you, Harold?) in "Short Spot" Vol3, No.3, Dec'89, p8. Mr. Watt sent me all the information, which I promptly mis-filed under "word-processors" instead of "Short Spot", so it's a little late in coming into print. However, better late than never...

Spectral Writer comes in three parts, a Basic Program 2K long; Menu Code starting at 31525 and Main Code starting at 55360. Load your cassette. Use symbol-shift/stop to get to the main menu. Select option D to go to Basic. Add Harold's three pokes, viz:-

```
     POKE 60957,207
     POKE 60958,57
and POKE 60959,201.
```

Snapshot the program to your disc and NEW the Spectrum. Now, type in this "DATACODE" program.

```
  5 RESTORE
 10 FOR x=31794 TO 31797: READ a: POK
    E x,a: NEXT x
 20 RESTORE
 30 FOR x=31835 TO 31838: READ a: POK
    E x,a: NEXT x
 40 RESTORE
 50 FOR x=31875 TO 31878: READ a: POK
    E x,a: NEXT x
```

```
 60 FOR x=31910 TO 31914: READ a: POK
    E x,a: NEXT x
 70 FOR x=31580 TO 31626: READ a: POK
    E x,a: NEXT x
100 DATA 68,105,115,99
110 DATA 100,114,105,118,101
120 DATA 67,79,78,86,69,82,83,73,79,7
    8,32,66,89,32,65,46,87,65,84,84,3
    2,70,79,82,32,70,79,82,77,65,84,3
    2,82,69,65,68,69,82,83
130 DATA 32,32,32,32,32,32,32,32
```

Save this program to disc, just in case of mistakes. Now run it. This gives a new "CODE 1". Save this to disc, as well with:-

```
SAVE D1"CODE 1" 31525,1243
```

O.K. so far? Good. The final bit is to type in this "MERGEWRITE" program.

```
   2 REM CONVERTION BY A.WATT
1600 CLS : LET a$=CHR$ VAL "2"+"LOAD T
     EXT FROM DISCDRIVE": GOSUB pr: GO
     SUB VAL "9520": GOSUB fn: RANDOMI
     ZE USR in: LOAD d*;f$CODE : RUN
2000 CLS : LET a$=CHR$ VAL "2"+"SAVE T
     EXT ON DISCDRIVE": GOSUB pr: GOSU
     B VAL "9520": GOSUB fn: GOSUB rq:
      IF f THEN GOTO VAL "2050"
2020 GOSUB if: SAVE d*;f$CODE VAL "327
     68",x: GOSUB vf
2050 GOSUB pm: GOSUB if: SAVE d*;f$COD
     E st,ln: GOSUB vf
2400 CLS : LET a$=CHR$ VAL "2"+"ERASE
     FILE ON DISCDRIVE": GOSUB pr: GOS
     UB VAL "9520": GOSUB fn: LET a$=C
     HR$ VAL "7"+"Press a key to erase
      the file": GOSUB pr: PAUSE NOT P
     I: ERASE d*;f$: RUN
2800 CLS : LET a$=CHR$ VAL "3"+"DIRECT
     ORY OF DISC": GOSUB pr: GOSUB VAL
      "9520": PAUSE NOT PI: RUN
7950 REM
9000 SAVE d*"writer" LINE VAL "9990":
     SAVE d*"code 1"CODE VAL "31525",V
     AL "1243": SAVE d*"code"CODE VAL
     "55360",VAL "10175": RETURN
9520 INPUT "Which drive (1/2)";A
9522 CAT A
9524 RETURN
9990 CLEAR VAL "31524": LOAD d*"code 1
     "CODE 31525,1243: LOAD d*"code"CO
     DE 55360,10175: GOTO VAL "107"
```

Save this to disc as (you'll never guess) "MERGEWRITE". And that's the load into Tasword or move it to a screen, or do much else with it. Please, Damian, could you send a Basic loader with the data, together with the assembler listing. This will cover most peoples' requirements. A little explanation to help me (and the readers) won't go amiss, either.

Tony Blythe, our evergreen correspondent has sent me a whole pile of programs on disc. Many of these are rehashes of earlier programs for use with SAM: one of them (a disc mapping routine and a modification of an earlier program by Andrew Brown) I found particularly useful. This could form the basis of lots of things...

```
  1 PRINT AT 4,4;"DISC_FILE SECTOR M
    APPER"; AT 6,10;"Version 1.3"; A
    T 8,6;"(c)By Andrew Brown"
  4 PRINT AT 10,4;"Modified for 'SAM
     Coupé"; AT 12,8;"By Tony Blythe
    "; AT 14,10;"June 1990": PAUSE 2
    00
  5 MODE 1
  6 POKE SVAR 15,0
 10 CLEAR 29999
 20 PAPER 1: PEN 7: BORDER 1: CLS
 30 PRINT PEN 6; BRIGHT 1;"  DISC_FI
    LE SECTOR MAPPER v1.3  "
 40 INPUT "Disc Drive Number: ";D
 50 IF D<1 OR D>2 THEN GOTO 40
 60 INPUT "SCREEN= 'S' :PRINTER= 'P'
    ";R$
 70 LET C=2: IF R$="P" OR R$="p" THE
    N LET C=3
 80 LET BUFF=30000: FOR T=0 TO 3: FO
    R S=1 TO 10
 90 READ AT 1,T,S,BUFF
100 LET BUFF=BUFF+512: NEXT S: NEXT
    T
110 FOR p=0 TO  79
120 LET PNT=30000+P*256: IF PEEK (PN
    T)=0 THEN GOTO 270
130 DIM N$(10)
140 FOR I=1 TO 10: LET N$(I)=CHR$ PE
    EK (PNT+I): NEXT I
150 PRINT #C'' INVERSE 1;"P";P; TAB
    5;"""";N$;""":-"
160 LET T=PEEK (PNT+13): LET S=PEEK
    (PNT+14)
170 LET SIZE=PEEK (PNT+12)+256*PEEK
    (PNT+11)
180 LET COUNT=0
190 PRINT #C;T;"/";S;" ";
200 READ AT 1,T,S,60000
```

hard bit.

Reset the Spectrum (or RUN USR 0), load in the Burtonpoked "Spectral Writer" snapshot, go into Basic using Menu option D and load in the new "DATACODE" code patch. Merge in the MERGEWRITE program, RUN and select option B, which saves the whole shooting match back to disc.

Now, in return, Mr. Watt would like to know if anyone has a complete conversion for "World Class Leaderboard", as multi-loading the whole data from cassette is pretty tiresome. I'm sure one of our readers will have the goods...

Robert Lundie has written in from Meopham, Kent, with a disc full of bits and pieces. The first program (colours) is simple and straightforward. Or is it? Can you find just what's going on? Incidentally, if you type this in and run it by pressing the F4 key, then press the key repeatedly, the program will subsequently re-run itself any number of times. Presumably on Sam, the keyboard buffer holds the F4 keystrokes and allows them to be picked up when the program has finished running. There is a corollary arising from this. Odd keystrokes can be left around and get in later to foul up your program - beware.

```
2 CLS #
3 LET yrg=142
4 FOR f=127 TO 1 STEP -1
5 PALETTE 0,f LINE f
6 NEXT f
7 PALETTE 0,0 LINE 2
8 PAPER 8: BORDER 8: PEN 0:
9 LET yrg=192
```

On a more serious note, Robert has been messing around with SAM's disc operating system, inspired, as he mentions, by Carol Brooksbank's "dir.repair" program in June's "Format". Provided that you know the directory number of the file you have just erased, and the type of file it was, and have not already overwritten it, he has written a little utility to recover it. Here it is.

```
10 CLEAR 59999
20 PRINT "Look for number of file o
   n      directory-press a key"
30 PAUSE
40 DIR 1
50 INPUT #2;'"Type number of subjec
   t file: ";dirno
60 LET trk=INT ((dirno-1)/20)
70 LET os=0
80 IF dirno/2=INT (dirno/2) THEN LE
   T os=256
90 LET sec=INT ((dirno-1-trk*20)/2)
   +1
100 READ AT 1,trk,sec,60000
110 PRINT ''"Select type of file:"'"
    1.BASIC"'"2.code"'"3.Number arra
    y"'"4.String array"'"5.48k Snaps
    hot"'"6.SCREEN$"''"7.ERASE the f
    ile"
120 INPUT "Select type:";ty
130 ON ty: LET f1=16: LET f1=19: LET
     f1=17: LET f1=18: LET f1=5: LET
     f1=20: LET f1=0
140 IF ty>7 OR ty<1 THEN GO TO 110
150 POKE 60000+os,f1
160 WRITE AT 1,trk,sec,60000
170 DIR 1
```

Finally, a snippet of information from Ettrick Thomson. On SAM, one DIM can cover several arrays, separated by commas, thus:- DIM d(9),h$(9,15) in the same way as LET.

I had hoped to include a lot more Spectrum stuff this month. Three things prevented me.

1. You only sent a bit in.
2. Many of the programs you've sent in this month had to be typed in. It takes a long time.
3. And it's pretty frustrating if at the end they don't work (and some didn't).

I can only include what is sent. So keep the bits and pieces coming.

Please send direct to me at:-

John Wase,
Green Leys Cottage,
Bishampton,
Pershore,
Worcs,
WR10 2LX.

WHAT DAY IS IT?

By:- Brian Pillipson.

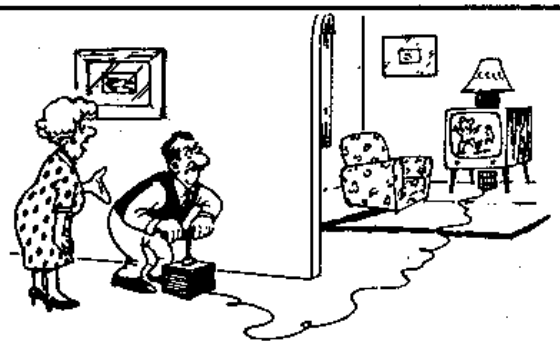
What day of the week were you born on? On what day will your birthday be in the year 1995. Most people dont know, and I was one of them until I wrote this program.

The program started as an exercise, playing with leap years and the other querks of the calander. There are however useful jobs the idea can be put to. If the logic were included as subroutines in a business program then you could print out the day as well as the date.

I have used the Month/Day/Year convention but it would be quite easy to alter the date input to DD/MM/YY if you want. The program also only copes with dates this century. Not a major limitation (unless you are over ninety and want to know your day of birth) but I expect FORMAT readers will soon send in extra routines that extend the period covered. The calander is a very interesting thing when you start to study it closely.

```
 10 BORDER 7: PAPER 7: INK 0: CLS
 20 PRINT "   *** DAY OF THE WEEK ***
    "
 30 PRINT AT 5,2;"This program will t
    ell you theday of the week for an
    y date in this century."
 35 PRINT : PRINT : PRINT
 40 PRINT "Please enter the date.
          Month then day then year.
        eg Jan 13th 1948 as 01/13/48
    ."
 50 PRINT AT 21,0;"MM/DD/YY."
 60 LET SC=21: LET SR=0: LET SL=2: GO
    SUB 8100
 70 LET M$="JANFEBMARAPRMAYJUNJULAUGS
    EPOCTNOVDEC312931303130313031303130
    31"
 80 DIM D$(3,2)
 90 LET D$(1,1)=SCREEN$ (21,0)
100 LET D$(1,2)=SCREEN$ (21,1)
110 IF D$(1)>"12" THEN PRINT AT 18,0;
    "There are only 12 months in
    a year.                          ":
    GOTO 60
120 IF D$(1)<"01" THEN PRINT AT 18,0;
    "The first month is 01.
                                     ":
    GOTO 60
130 LET SR=3: GOSUB 8100
140 LET D$(2,1)=SCREEN$ (21,3)
150 LET D$(2,2)=SCREEN$ (21,4)
160 IF D$(2)<"01" THEN PRINT AT 18,0;
    "There must be at least 01 day i
    n the month.                     ":
    GOTO 130
170 LET X=VAL D$(1): LET X=X*2
180 IF D$(2)>M$(X+35 TO X+36) THEN PR
    INT AT 18,0;"There are only ";M$(
    35+X TO 36+X);" days in that mon
    th.                              ": G
    OTO 130
190 LET SR=6: GOSUB 8100
200 LET D$(3,1)=SCREEN$ (21,6)
210 LET D$(3,2)=SCREEN$ (21,7)
220 LET Y=VAL D$(3)
230 LET LEEP=(Y/4-INT (Y/4))*4
240 IF LEEP<>0 AND D$(1)="02" AND D$(
    2)>"28" THEN PRINT AT 18,0;"That
    was not a leap year.
                                 ": GOTO
    190
250 CLS
260 LET D=VAL D$(2)
270 LET M=VAL D$(1)
280 IF D$(1,1)="0" THEN LET D$(1,1)="
     "
290 IF D$(2,1)="0" THEN LET D$(2,1)="
     "
300 LET Q$="Saturday Sunday   Monday
     Tuesday  WednesdayThursday Frid
    ay   "
310 FOR N=1 TO M-1
320 LET D=D+(VAL M$(N*2+35 TO N*2+36)
    )
330 NEXT N
340 IF LEEP AND M<=2 THEN LET D=D+1
350 LET D=D+(Y*365)+(INT (Y/4))
360 LET Z=((D/7)-INT (D/7))*7
365 LET M=M-1
370 PRINT M$(M*3+1 TO M*3+3);" the ";
    D$(2);"th, 19";D$(3);".","Is a ";
    Q$(Z*9+1 TO Z*9+9)
```

```
380 IF D$(2)=" 1" OR D$(2)="21" OR D$
    (2)="31" THEN PRINT AT 0,10;"st"
390 IF D$(2)=" 2" OR D$(2)="22" THEN
    PRINT AT 0,10;"nd"
400 IF D$(2)=" 3" OR D$(2)="23" THEN
    PRINT AT 0,10;"rd"
500 PRINT AT 10,0;"Press any key to c
    ontinue       or space to end."
505 PAUSE 0
510 IF INKEY$=" " THEN CLS: STOP
520 GOTO 0
8000 REM SUBROUTINES TO ENTER TEXT ONT
    O ANY PART OF THE SCREEN. VARIABL
    ES PASSED ARE SC;STARTING COLUMN,
    SR;STARTING ROW,SL;LENGTH OF FIEL
    D,Q$,N,L;INTERNAL TO SUBROUTINE
8010 REM CLEAR FIELD FIRST
8020 PRINT AT SC,SR;" ";
8030 FOR N=1 TO SL-1
8040 PRINT ;" ";
8050 NEXT N
8100 REM ENTER LOOP
8101 LET L=SL
8110 PRINT AT SC,SR;"_";CHR$ 8;
8111 IF INKEY$<>"" THEN PAUSE 5: GOTO
    8111
8112 LET Q$=INKEY$
8120 IF Q$="" THEN GOTO 8112
8125 BEEP .01,20
8130 IF Q$=CHR$ 13 THEN PRINT ;" ";: R
    ETURN
8140 IF Q$=CHR$ 12 THEN GOSUB 8200: GO
    TO 8111
8150 IF Q$<"0" OR Q$>"9" THEN GOTO 811
    2
8160 PRINT ;Q$;: IF L>1 THEN PRINT ;"_
    ";CHR$ 08;
8170 LET L=L-1
8180 IF L=0 THEN RETURN
8190 GOTO 8111
8200 IF L<SL THEN PRINT CHR$ 08;"_ ";C
    HR$ 08;CHR$ 08;: LET L=L+1
8210 RETURN
9000 SAVE d*"weekday" LINE 0: VERIFY d
    *"weekday"
```



'I know he's not your favourite, but couldn't you just switch off?'

SAMTAPE2

A FULL REVIEW

By:- John Wase.

This utility tape for the SAM Coupé by well-known LERM software is a cracker. It enables you to run many of those old Spectrum programs, both games and utilities, which you didn't want to throw away when you upgraded. All you need is your old 48K Spectrum, for once again this program uses your old Spectrum ROM code. I know this seems like old hat. After all, when you bought a SAM, you bought a new machine. However, there is all your old software. It's also old hat in that MGT have provided a Spectrum emulator, and many magazines have followed FORMAT's lead and published details of how to run a Spectrum ROM in SAM.

Nevertheless, this tape has a number of enormous advantages over anything which has gone before. All the facilities which you might have needed are there, and the whole thing is specially tailored to make transfers easy. Let's take a look at it.

Essentially, it consists of a two-program package. One program, the "SAMtape" program (program "ST") is intended for games players. Programs loaded into "ST" will snapshot to SAMdisc at any point in the game, and can be stopped at any stage, and PEEKed and POKED to taste. Effectively, you have the equivalent of one of those add-ons with a snapshot button. Good.

In addition, there's another program called SAMspec. This program is intended to be used with utilities: programs which require access to a disc for loading and saving things and also to the printer port. As LERM say, typical examples are Tasword 2, assemblers and disassemblers. LERM do not guarantee 100% compatibility; that would be asking too much, but they have produced a tape which makes things as easy as possible.

Let's start with their tape. On it are five files. Precise instructions are given in the accompanying 26-page closely typed photoreduced A5 manual: sufficient even for a goon like me, tired after a day at work and already having sorted out some University work in the evening. The process involves saving your Speccy ROM, and having a couple of formatted discs ready. It's worth repeating that I bought specially one of MGT's recommended cassette recorders as I had loading difficulties; the tape then loaded first time. The user, incidentally, is warned that it is totally unacceptable for SAM owners to save ROM code from someone else's Spectrum; you must use your own.

After that, it's simply a question of operating the recorder, following the instructions (they're mug-proofed, so that if a file doesn't load, you are told what to do), starting and stopping the recorder and ensuring discs are in the drive. A word of warning, though; it all takes quite a lot of time: you will probably need the best part of an hour or more. At the end of it all, the appropriate files are on discs. A little niggle is that the autoload SAMtape file (around 27k) is hidden: to me that's a nuisance, for I like the directory to show what's on the disc.

That's what you do: now, how does it perform?

The first thing I tried was a game. Formatted a disc: loaded the SAMtape disc, up came a menu, saved SAMtape on my new disc. No good: you need to save a DOS as first file for autobooting: pity SAMtape doesn't have this option. Nevertheless, its main menu gives six easy options on the first six function

keys - F0 for Spectrum (reset), F1 for SAMdisc operations, F2 for POKE mode, F3 for NEW, F4 for COPY SAMtape and F5 for return to Spectrum Program. And it's a piece of cake. Enter Spectrum mode (F0), do LOAD "" (dont forget that " is symbol shifted p!), load the tape and press the NMI button. The border goes purple. Key "m" then gives you the main menu and F1 the disc menu. Select "save", type in a name and the deed is done. F5 returns you to the Spectrum, (still with a purple border), locked, as with the NMI button. Tapping the space bar turns the border black and the program continues where it left off. POKEing is just as easy: just follow the instructions. Finally, there is a rename option with a wrinkle to overcome interrupt-mode protection. Great! Now 48k games will go on disc.

All this is fine for a game (which doesn't need to access discs or printer whilst running). What about utilities? Well, LERM's utilities utility is SAMspec. The first utility I tried was a map-drawing program. Don't forget the formatted disc with SAMdos. Start with LERM's master disc and load SAMspec. Up comes a different menu - clone, menu, spect, basic, snap and loader. Enter "spect", merge the utility. To get it to rerun, add line 9999 GOTO ****, which is the program's autoline number, breaking in if necessary. Type "NEW" to return to the menu in SAM. Select "snap" and type in the filename. Fine: it now reloads from disc. Then comes the hassle. You've got to find the LOADs, SAVEs, LPRINTs and COPY commands and alter them. LOAD and SAVE have to go from SAMbasic, and methods of doing this are explained, together with methods of sending binary or tokenised outputs to a printer. Finally, information is provided so that your program will be completely autobooting: just press key F9.

I found the instructions clear, though the whole thing is quite time-consuming, and is not for the non-programmer. I chose a utility I hadn't used for years: Shiva's map. Eventually, after a couple of self-made blunders, I sorted it out. Excellent.

The final test involved transferring Tasword Two from tape to disc. As Tasword is something that's obviously going to be popular, LERM have provided special instructions, together with instructions for some of their toolkit programs, and special patches are included for SAMspec adaptation. I reeled in my elderly Tasword Two tape (a family heirloom, complete with dot-matrix reproduced instructions - how Tasman have come on). It all worked smoothly. Up came the familiar Tasword screen. I tested typing, saving, loading and printing. All worked. What I found totally fascinating was the ability to swop between one lot of Basic, the familiar Speccy Tasword Two, to another load of SAMbasic elsewhere in the machine, which controlled printing, saving loading and return to Speccy - I'm not used to a computer which contains two lots of Basic!

The modified SAMspec Tasword would also load original T2 files (recorded almost ten years ago on cassette). You've got to be a bit careful about this: pressing "b" in the main menu puts you into SAMbasic, not Speccybasic - you need to break to get that. Then all it needs is LOAD "" CODE: up came Manjit's ten-year old discourse on inhibition of oxidative phosphorylation! At first I had started to load in SAMbasic, adding addresses: it's much simpler direct from Speccy. LERM could with advantage have mentioned this information in the Tasword conversion section. Although Tasman's new SAMT2 has a pretty coloured screen and the ability to print multiple copies, it also has a dreadful keyboard bounce which is notably absent in the SAMspec conversion, due to some magic LERMery.

AT £9.95, LERM's tape would be good value for this conversion alone: to have all the facilities it provides available with such convenience and such clear instructions makes it a snip. Even I found it easy to use! Highly recommended.

THOUGHT SPOT.

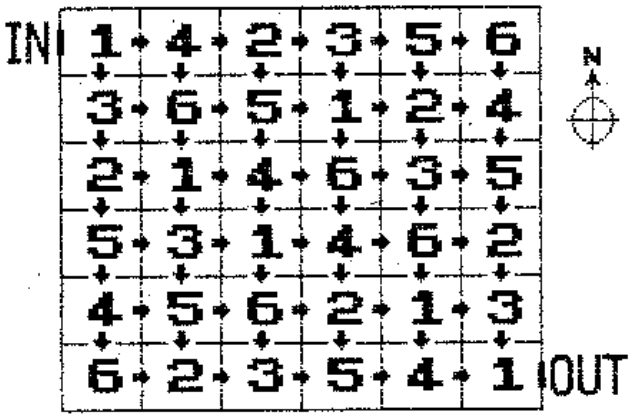
By:- Jeremy Cook.

Hello and welcome. As the title suggests, this is where you do some thinking. This is FORMAT's new puzzle page. If you are not very good at puzzles, don't despair, you should be able to do a couple of these!

Each month I would like to present a varied selection of problems, including number, word and logic puzzles, or anything else that might be thought provoking.

Also every month I will also present a problem which will usually be best solved by writing a short program. The Editor tells me that a prize of ONE YEARS FREE subscription to FORMAT is being offered for the best solution to these problems. To allow most people (including our many overseas readers) time to get their entries in about two months will be allowed for these competitions and the winning program will be printed after that time. The other answers will generally be published the month after the puzzles appear. So, brains in gear and off we go!

PRIZE PUZZLE NO.1: MAZE OF NO RETURN



The figure above shows the layout of the Maze of No Return, so called because few return alive! The doors only allow movement east or south and each location has a number of gold coins to be collected, as shown. To get out you must pay the gatekeeper the maximum amount of gold, otherwise your life and coins are immediately forfeit. How many coins need to be collected to get out and how many ways can they be obtained?

Write a short program to solve the puzzel and send your solution to the usual FORMAT address. The closing date for this first PRIZE compo is Monday 1st October. I will award the prize to what I consider to be the best solution. The result will be given in the November issue.

And now on to a few puzzels that are just for fun.

CROSSNUMBER

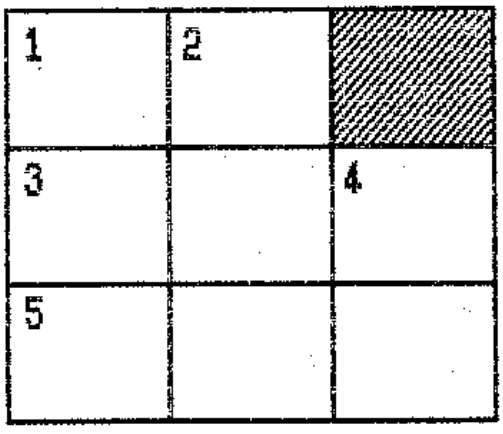
The answers to the clues below are numbers and should be entered into the grid at the places indicated, as in a crossword. There are no zeros.

ACROSS

1. Two less than a prime number
3. An odd number
5. Three is a factor

DOWN

1. 3 Across plus 5 Across
2. 4 Down is a factor
4. A perfect square



REBUS

A rebus (also known as a Dingbat) uses pictures, numbers and letters of the alphabet to make words and sentences. For example, the first one below means "you're under arrest". Can you decipher the others?

1. arrest
   you're

2. DDEE

3. 1sa3f6et72y5

4. ho..

VOWELECTOMY

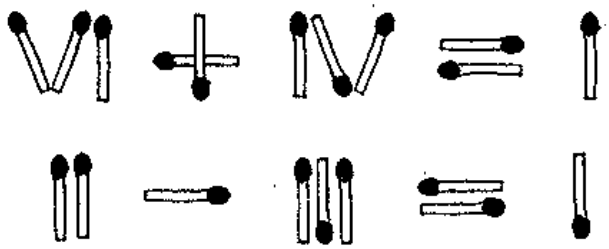
Here are some not uncommon words with all their vowels removed. What are the most likely words?

VCM SSG CHS VHCL RTH

CBNT LSKN THTR MRJRM PZZZZ

MATCH PLAY

(a) In the diagram below there are two Roman numeral sums composed of matches. They are both wrong. In each case move just one match to make them correct.



(b) Using only eight matches produce a pattern containing four triangles and two squares.

That's all for this month, but I would be interested in your comments - are these puzzles too easy, too hard or about right? Should a computer magazine have a puzzle page? If so should all the puzzles be computer orientated, or not?

Goodbye and come again next month.

SC_ASSEMBLER

SAM'S NEWEST MACHINE CODE TOOL REVIEWED

By:- Carol Brooksbank.

A while ago, talking to our esteemed Editor, I ventured the opinion that I would never find a SAM Coupé assembler that I felt really comfortable with, because the software house responsible for my favourite Spectrum one had long ago vanished from the scene.

I am delighted to say that I have been proved thoroughly wrong. Steve Nutting - officially known as Steve's Software - has produced a really first-class assembler/disassembler. It is completely disc-based, and at present only the 256K version is available, but it runs on 512K machines too - it simply does not use the extra memory. Later in the year Steve will bring out the 512K version, with extra facilities like a monitor, for £15, but purchasers of the present version will be able to upgrade for £5 - so you will not lose out by buying now.

The assembler is a delight to use. The full-screen editor has a 64-column line - 62 columns available for text and two used for a memory bank status display - which means that what you see on screen is what you get in a printout, and it fits very neatly on an 80-column page. So often assembler printouts, having a 32 column line, look terrible in hard copy.

All the standard op-codes, and the pseudo-ops like DB,DM,DW and DS are recognised, and so are the undocumented codes which so many assemblers refuse to have anything to do with.

Those who have seen my writings about assemblers will know that I have no patience with programs that restrict you to ridiculously short labels. This one allows upto 14 characters - even I can manage with that many!

Entering your source code is so easy. You don't need to worry about putting things in the right fields. You can enter labels and opcodes any old way, and so long as you separate the labels from the opcodes with a colon, the program sorts them all out and puts them neatly into the right fields - no hassle with tabs, or error messages because you put XOR A where the labels should go.

My one complaint is that, while opcodes are converted to upper case and notes left as you entered them, labels are converted to lower case. I should like to see labels left as you entered them too, simply because, if you use a lot of notes in listings as I do, everything stands out more clearly if notes are in lower case and labels and opcodes in upper case. Lower case labels seem to disappear into the notes.

One very practical feature is that two of the function keys are defined to print brackets. You have no idea how much time you save by not having to reach for symbol shift every time you want to enter something like LD A,(HL). Another time-saver, the function keys, can be toggled to act as a number pad if you have a lot of data bytes to enter, and the point below F9 is redefined as a comma - because that is what you need between data bytes.

Auto line numbering with user-defined start and step is provided, as is renumbering. Single lines or blocks may be deleted, and interestingly, blocks of lines may be SAVED - most useful if you are developing a subroutine library. Most of the commands are one-letter entry, r for RENUMBER, l for LIST, d for DELETE. Others are preceded by "+" - +d for decimal number conversion to

hex and binary, +h and +b for hex and binary conversion to the other conventions, +s for save source file to disc. I took a minute to get used to these short commands - couldn't understand why I got an error message when I typed LIST in full. But it all makes for time-saving and easiness in use.

Error messages are plain and simple -"number too big (0-255)" or "() expected" are examples. There is a most useful find option which will search the file and list all the occurrences of a number, opcode, label or remarks string.

The two-pass assembly, especially if you do not print to screen or printer, is very quick. The first pass displays the ORG and PUT addresses and the length of the code. Lines with errors are displayed on screen so that you can correct them without listing the program.

Assembly can be in decimal or hex, and if you use decimal the object code bytes are in decimal too. I have met many an assembler which claimed to give a decimal option, but only listed the addresses in decimal, leaving the object code in hex. You are prompted when making your working copy from the master disc to choose your preference for hex or decimal, but if you want to switch to the other choice later, a simple BASIC poke does the trick.

Source listing and assembly can be sent to printer. I like to send a number of printer codes when listing source code and assembly - page length, skip-over-perforations, American typeface so the hex hash marks (#) don't come out as "£" signs and so on. It was simplicity itself to drop into BASIC, (use q, x, or b), write an extra line 5 which sends the codes, and re-save the "auto" program. Now the program customizes my printer every time it is run.

The disc operations were not complete on the copy I received, but he had included BASIC SAVE/LOAD/DIR operations from within the program. The finished version will have all these running from machine code and the MERGE and ERASE options will then be included. I could not discover how to send the symbol table to the printer, but I suspect this is something Steve still has to implement. He plans to send the final 256K version, with the proper manual when that is ready, free of charge to those who buy his pre-production version now.

The real manual is much needed. The program at present comes with a number of sheets of A4, which, while they give all the information you need, are a little difficult to find your way around.

Even the 256K version can hold vast source code files. Six memory pages, in three banks, are assigned to source code, and a bank of two pages to object code. You switch source code banks yourself. As you enter your code, there is a display on screen looking for all the world like a thermometer, with the bank number on top. The "mercury level" rises as you enter code, and when it reaches the top of the scale you hit a function key to change banks. To give you an idea of the amount of memory available, I entered six pages of heavily annotated source code, and it registered less than a quarter on the scale of the first bank.

The source file is saved to disc in several files, one for each bank used plus one which acts as a loader. You can, in fact, use the same line numbers in each bank, and commands like l(ist), r(enum), d(elete), etc. only affect the current bank.

The command +z takes you into the disassembler. Again, this recognises the undocumented opcodes as well as all the regular ones, and disassembly can be in hex or decimal, to screen or printer. The disassembler has two modes. In NORM node, ROM 0 is at 0-16383 and normal RAM 16384 - 65535. In ROMS mode, ROM 0 is still in its

Turn to page 30 col 2.

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BEYOND SIMPLE UDGs

PART 9. **By:- Clyde Bish.**

Last time we entered the basic elements and control routines of our maze game. Now we have it up and running we can build on that basic program and make it more entertaining - and difficult! (This is the best way of going about writing a program. All too often budding programmers spend hours designing elaborate titles and end screens BEFORE they set about writing the program itself. The result is often a let down once the "wow" of the main title has worn off. Take a tip and start with the basics, THEN worry about super graphics and amazing animations!)

O.K. So what can we do to spice up our basic maze game? Well, there's that mischevious Green Goblin I hinted at last time. And, of course, there's YOU. You're about to become a star of the video screen! Alright, only as a matchstick person a la Lowry but you will turn and walk. I'll explain the animation technique later when we look at the program lines.

For both you and the Green Goblin we'll need some user defined graphics. We could save these separately as code and get the program to load them in before starting but its smoother to let the program set them using a READ/DATA statement whilst the instruction screen is being displayed. This does not cause the usual noticeable delay whilst they load in from tape. (If you're surprised by the form of the DATA at line 9000 I'll let you into a secret. I have a routine which will transfer udg bytes to a DATA line. I'll go into details as to how it works some time in the future.)

Now its time we entered the lines from Program 2. Note that the graphics characters are shown in FORMAT's standard way ie {GS 8} means enter G-mode and press cap-shift and 8.

No doubt whilst keying the program in you'll have noticed that many lines are extensions to ones from the basic maze. You could load in Program 1 from last issue then edit those lines but its easier, and probably more accurate to type in Program 2 as it stands, save it, load in Program 1 then Merge back Program 2. You'll make less mistakes that way!

Now, as before we'll have a look at what these new and altered lines will do:-

4001: This is called within the subroutine at 3000 and displays you as a stick person with hands on hips looking into the next area of the maze. The variable V (set in the maze element routines) determines the Print row of the figure.

3000: This "which way?" routine has been extended. It calls the "print-a-man" routine detailed above also also includes the Green Goblin routine. If the player does not respond within about three seconds the Green Goblin appears and sends you back to the start. The moral is have a good memory and don't be indecisive!

2000-2005: The "passage wall" routine from Program 1 now also includes the stick man. When you press the key to turn back he does do.

4600: A complex logic sequence which on the command 5 or 8 causes the animated figure to walk to the left or right before disappearing around the corner of the passage. The technigue used deserves further explanation. After turning the stick man to right or left with the GOSUB 5000 call (see below) the N loop is set up from either 16 to 28 if walking right, or 15 back to 3 if walking left. The step value is set to 1 - 0 = 1 if b$ = "8",

or 0 - 1 = -1 if b$ = "5". Let's assume the latter is the case. The next statement overprints the existing picture with the back half of the figure in mid stride, the front half being printed in the column to the left. The next sequence overprints this with the standing man image, blanking out the rear half with spaces. The stages are shown in Fig.1, but with each picture in the sequence displaced vertically so that all three can be seen at once. In this way you can see that the figure is only moved on half a column at a time and so produces smooth animation without the use of pixel-controlling machine code. Obviously when the man disappears around the corner only the rear half is shown in the final image.

4800: This causes the figure to move forwards on the command key 7. Again a sequence of images is used, each one overprinting the previous one.

5000: This turns the figure to left or right before walking (or bumping into the wall).

6005-6010: Information about the Green Goblin is now included in the title screen and a READ/DATA loop is set up to read the udg data in line 9000.

8000-8020: A more elaborate "win" routine is included when The gold is reached (much to the chagrin of the Green Goblin). A surprise awaits you before you'll be allowed to play again but I won't let you into the secret. In a moment you can find out for yourself!

I haven't said anything about the changes made to the maze element GOSUBs (e.g. lines 1010 - 1070). These changes call up the various "draw-a-man" routines we've been putting in this time. I'll leave you to figure out how they work.

Next month we'll have a closer look at those logic lines we've been making a lot of use of recently. In the mean time venture forth into the maze to find the gold. And may all your goblins be little ones!

MAZE PROGRAM - PART 2

Add these lines to Part 1 printed last month.

```
 200 FOR I=1 TO Y: GOSUB VAL X$(I)*100
     +1000: IF N>160 THEN GOTO 200
 205 LET I=I+1: GOSUB VAL X$(I)*100+10
     00: IF X$(I)="7" OR N>160 THEN GO
     TO 200
1010 LET P=19: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1015 IF B$<>"7" THEN LET P=20: GOSUB 2
     000: GOTO 1000
1020 LET C=1: LET P=18: GOSUB 4800
1060 LET P=18: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1065 IF B$<>"5" THEN LET P=19: GOSUB 2
     000: GOTO 1050
1070 GOSUB 4600: PAUSE 50: RETURN
1110 LET P=19: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1115 IF B$<>"7" THEN LET P=20: GOSUB 2
     000: GOTO 1100
1120 LET C=1: LET P=18: GOSUB 4800
1160 LET P=18: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1165 IF B$<>"8" THEN LET P=19: GOSUB 2
     000: GOTO 1150
1170 GOSUB 4600: PAUSE 50: CLS : RETUR
     N
1210 LET P=19: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1215 IF B$<>"7" THEN LET p=20: GOSUB 2
     000: GOTO 1201
1230 LET P=18: LET C=0: GOSUB 4800: RE
     TURN
1320 LET P=19: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1325 IF B$<>"7" THEN LET P=20: GOSUB 2
     000: GOTO 1300
1330 LET C=1: LET P=18: GOSUB 4800
1370 LET P=18: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1372 IF B$<>"8" AND B$<>"7" THEN LET p
     =19: GOSUB 2000: GOTO 1350
1375 IF B$<>"7" THEN GOSUB 4600: PAUSE
      50
1378 IF B$<>"8" THEN LET P=17: LET C=0
     : GOSUB 4800
1420 LET P=19: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1425 IF B$<>"7" THEN LET P=20: GOSUB 2
     000: GOTO 1400
1430 LET C=1: LET P=18: GOSUB 4800
1470 LET p=18: GOSUB 4000: GOSUB 3000:
      IF N>160 THEN RETURN
1472 IF B$<>"5" AND B$<>"7" THEN LET P
```

```
    =19: GOSUB 2000: GOTO 1450
1475 IF B$<>"7" THEN GOSUB 4600: PAUSE
     50
1478 IF B$<>"5" THEN LET C=0: LET P=17
    : GOSUB 4800
1510 LET P=19: GOSUB 4000: GOSUB 3000:
     IF N>160 THEN RETURN
1515 IF B$<>"7" THEN LET P=20: GOSUB 2
    000: GOTO 1500
1520 LET C=1: LET P=18: GOSUB 4800
1560 GOSUB 4000: GOSUB 3000: IF N>160
    THEN RETURN
1565 IF B$<>"8" AND B$<>"5" THEN LET P
    =19: GOSUB 2000: GOTO 1550
1570 GOSUB 4600: PAUSE 50: RETURN
1610 LET P=19: GOSUB 4000: GOSUB 3000:
     IF N>160 THEN RETURN
1615 IF B$<>"7" THEN LET P=20: GOSUB 2
    000: GOTO 1600
1620 LET C=1: LET P=18: GOSUB 4800
1660 GOSUB 4000: GOSUB 3000: IF N>160
    THEN RETURN
1670 IF B$="7" THEN LET P=17: GOSUB 48
    00: RETURN
1680 IF B$="8" OR B$="5" THEN GOSUB 46
    00: PAUSE 50: RETURN
1710 LET P=19: GOSUB 4000: PRINT AT 10
    ,13;"DEAD END";AT 14,11;"Back to
    the";AT 17,14;"START": PAUSE 160:
     CLS : RETURN
2000 IF B$<>"7" THEN GOSUB 5000
2005 LET P=18: GOSUB 4000
2015  PRINT AT 20,11;"    ";AT 20,18;"
       ";AT 21,13;"       ": PAUSE 1
    0: LET P=19: GOSUB 5001: PAUSE 20
    : CLS : RETURN
3000 PRINT AT 20,10;"WHICH";AT 20,18;"
    WAY?";AT 21,10;"Press";AT 21,18;"
    5,7 or 8": FOR N=1 TO 160: IF INK
    EY$<>"" THEN GOTO 3050
3010 NEXT N
3020 PRINT AT 15,12; INK 4;"o";AT 16,1
    2;"O";AT 17,12;"{G B}": PAUSE 30:
     PRINT AT 9,11;"TOO SLOW!";AT 10,
    14;"The";AT 11,10; INK 4;"GREEN G
    OBLIN";AT 12,11; INK 0;"sends you
    ";AT 13,10;"BACK TO THE";AT 14,12
    ;" START  ": PAUSE 100: RETURN
4001 PRINT AT P,16;"O";AT P+1,16;"{G C
    }";AT P+2,16;"{G B}": RETURN
4600 LET P=19: GOSUB 5000: FOR N=(16 A
    ND B$="8")+(15 AND B$="5") TO (28
     AND B$="8")+(3 AND B$="5") STEP
    (B$="8")-(B$="5"): PRINT AT 18,N;
    "{G G}{G H}";AT 19,N;"{G I}{G J}"
    ;AT 20,N;("{G K}{G L}" AND B$="8"
    )+("{G M}{G N}" AND B$="5"): PAUS
    E 5: PRINT AT 18,N;(" O" AND B$="
    8")+("O " AND B$="5");AT 19,N;("
    {G D}" AND B$="8")+("{G D} " AND
    B$="5");AT 20,N;(" {G E}" AND B$=
    "8")+("{G F} " AND B$="5"): PAUSE
     5: NEXT N: PRINT AT 18,N;("{G G}
    " AND B$="8")+("{G H} " AND B$="5
    ");AT 19,N;("{G I}" AND B$="8")+(
    "{G J} " AND B$="5");AT 20,N;("{G
     K}" AND B$="8")+("{G N} " AND B$
    ="5"): PAUSE 5: PRINT AT 18,N;" "
    ;AT 19,N;" ";AT 20,N;" ": RETURN
4800 PRINT AT P,16;"o";AT P+1,16;"{G O
    }";AT P+2,16;"{G P}";AT P+3,16;"
    ": PAUSE 10: PRINT AT P-1,16;"{G
    Q}";AT P,16;"{G R}";AT P+1,16;"K$
    RRRR";AT P+2,16;" ": PAUSE 10+(10
     AND C=1)
4810 IF C=1 THEN LET C=0: RETURN
4820 PRINT AT P-1,16;"{G T}";AT P,16;"
     ";AT P+1,16;" ": PAUSE 20: LET C
    =0: RETURN
5000 PRINT AT P,16;"{G D}";AT P+1,16;(
    "{G E}" AND B$="8")+("{G F}" AND
    B$="5"): PAUSE 30: RETURN
5001 PRINT AT P,16;"{G D}";AT P+1,16;(
    "{G E}" AND B$="5")+("{G F}" AND
    B$="8"): PAUSE 30: RETURN
6005 PRINT AT 15,0; FLASH 1;"BEWARE!";
    AT 16,0; FLASH 0;"The "; INK 4;"G
    REEN GOBLIN"; INK 0;" will be
        following you. Don't take too
       long making a decision or he'l
    l catch up and send you back to
     the start"
6010 RESTORE : FOR I=USR "a" TO USR "u
    "+7: READ Z: POKE I,Z: NEXT I
8000 GOSUB 1700: PRINT AT 16,15; INK 6
    ;"{GS 8}{GS 8}";AT 17,13; INK 4;"
    {GS 8}{GS 8}{GS 8}{GS 8}{GS 8}{GS
     8}";AT 18,13;"{GS 8}{GS 8}{GS 8}
    {GS 8}{GS 8}{GS 8}";AT 19,11; INK
     0;"O";AT 20,11;"{G C}";AT 21,11;
    "{G B}";AT 16,21; INK 4;"o";AT 17
    ,21;"O";AT 18,21;"{G B}"
8010 PRINT AT 9,17; INK 4; FLASH 1;"CU
    RSES!";AT 11,18; INK 0; FLASH 0;"
    You've";AT 12,19;"Found";AT 13,21
    ;"the";AT 14,20; INK 6;"GOLD"
8015 PAUSE 200: PRINT AT 1,6; FLASH 1;
    "BUT YOU WON'T GET OUT!": PAUSE 2
    00: BORDER 0: PAPER 0: CLS : INK
    6: FOR I=0 TO 21: PRINT AT I,I;CH
    R$ 72+CHR$ 65+CHR$ 33: BEEP .1,-I
    : NEXT I: PAUSE 200: BORDER 7: PA
    PER 0: CLS : INK 0
8020 RESTORE 9001: LET b$="": FOR f=1
    TO 28: READ n: LET b$=b$+CHR$ n:
    NEXT f: PAPER 7: CLS : PRINT {SS
```

```
    3}0;b$: PAUSE 200:{ES 0} BORDER 4
8999 STOP
9000 DATA 60,60,60,60,60,24,36,36,66,6
     6,66,66,66,66,66,195,60,90,153,15
     3,90,60,24,36,24,24,24,24,24,24,2
     4,24,16,16,16,16,16,16,16,24,8,8,
     8,8,8,8,8,24,0,3,4,4,4,4,3,0,0,19
     2,32,32,32,32,192,0,3,5,9,17,33,6
     5,1,2,192,160,144,136,132,130,128
     ,64,2,4,4,8,8,16,16,24,64,32,32,3
     2,16,16,16,24,2,4,4,4,8,8,8,24,64
     ,32,32,16,16,8,8,24,56,124,124,12
     4,124,56,68,68,68,68,196,4,6,0,0,
     0,0,0,0,0,0,0,24,36,36,24,60,60,6
     0,24,36,36,36,4,0,0,0,0,0,0,56,40
     ,16,56,56,56,40,32,36,36,32,32,0,
     0,0,0
9001 DATA 127,32,49,57,56,50,32,83,105
     ,110,99,108,97,105,114,32,82,101,
     115,101,97,114,99,104,32,76,116,1
     00
```

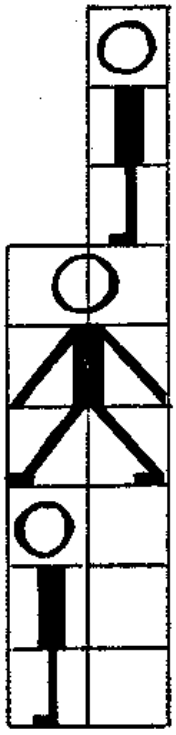
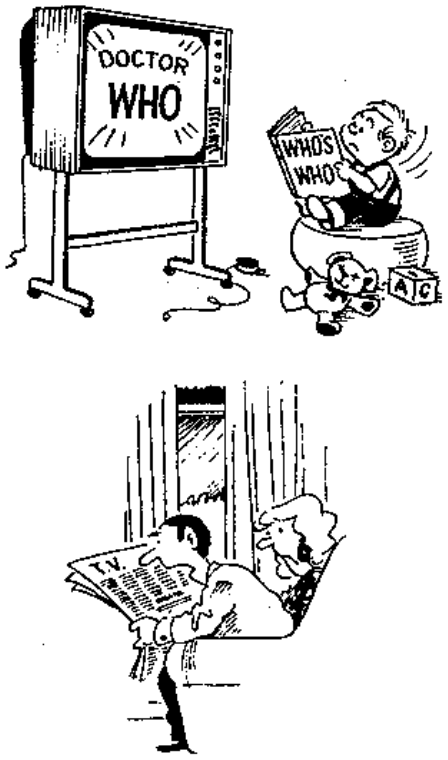
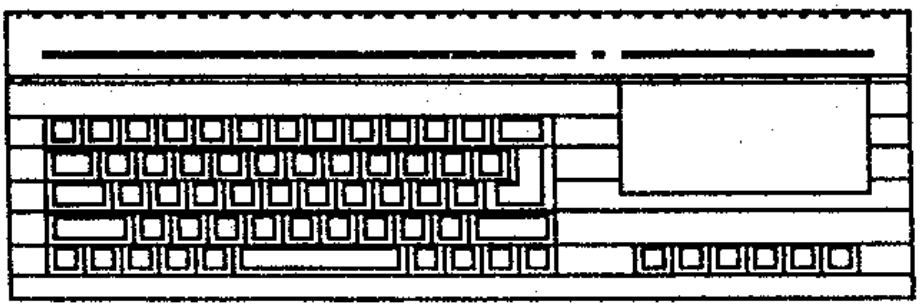


Fig 1.



'What would you like to watch again?'

INDUG members special offer.



Under new ownership

Hackers Workbench is the ultimate program for snapshots on the Disciple and PLUS D. **Hackers workbench** contains in a single program over 16 functions to allow any 48K or 128K snapshot to be hacked, some functions are not found on any other hacking program. With **Hackers Workbench** you can examine, search, alter, disassemble and even compare with another snapshot any part of memory or any of the Z80 registers. Works in both hex or decimal with all output going to either or both the screen and printer. **Hackers Workbench** is the only hacking program for the Disciple and the best for the PLUS D. Supplied on cassette for any system for only £9.90. (£8.50 to INDUG members) Please add 50p UK postage (£1.20 overseas). Only from **S D SOFTWARE. 3 Mitchell Place, Falkirk, Stirlingshire, Scotland. FK1 5PJ.**

nb. Latest dos required

NEV'S HELP PAGE

By:- Nev Young.

Leslie Pollard is puzzled by two error messages that keep coming up. The first is "Invalid Colour" and the next "End of file"

To understand the first you must know how the Spectrum sets colours on the screen. If you look at chapter 27 of your spectrum handbook you will find the character set. The interesting characters are those with codes from 16 to 23. As you see code 16 is described as INK control. This can be read two ways either code 16 is the ink control character or code 16 is the ink character followed by a control character.

Just think for a moment how you set the ink colour in a program, INK <number>. Just try typing this as a direct command with different numbers. Of course you won't see anything happen but anything that gets printed will be in the ink colour you have set. But what if you try INK 42. You get the invalid colour message, because there is no colour 42.

You can also set the colour by placing the ink command into a string. For example try:-

```
10 PAPER 7: INK 0
20 PRINT "abcd";INK 4;"efgh"
```

As you see the last part is in green. Now change line 20 to:-

```
20 PRINT "abcd";CHR$ 16;CHR$ 2;"efgh"
```

Now you see the string turn red. What we have done is send the INK code our selves. Now change the 2 to a number greater than 9 and you will get the invalid colour message again.

If you try and MOVE a file to the screen just to look at it, as I often do, then there is a good chance that the file will contain characters that can not be printed. Especially if the file is a code file or a basic program which both contain binary data. You can now imagine what will happen if you happen to have a binary byte of data with a value of 16 followed by another with a value greater than 9. Thats right - Invalid colour.

An example of this would be the program:-

```
16 REM 1234567890
```

Save that by:- SAVE d1"junk" then try MOVE d1"junk" TO #2 to display it.

Now if you write the following program:-

```
10 CLEAR #
20 OPEN #4;d1"junk" IN
30 PRINT CODE INKEY$#4
40 GOTO 30
```

and run it you should get the following list of numbers:-

```
0 16 0 203 92 16 0 255
255 0 16 12 0 234 49 50
```

This is what is actually on the disc. What does it mean?

```
0                 = basic program
16 0    = 16      = length of program
203 92  = 23755   = memory start address
16 0    = 16      = program length
                    without variables
255 255 = 65535 = Autorun line number
0 16    = program line number (16)
12 0    = 12      = length of line
234     = REM
49      = "1"
50      = "2"
```

Thats what it means, but when you try to MOVE it the real meaning is lost and so the following meaning is

given to the data.

```
0       = "?"
16 0    = INK 0
203     = "THEN"
92      = "\"
16 0    = INK 0
255     = "COPY"
255     = "COPY"
0       = "?"
16 12   = INK 12 Oh oh thats an error.
```

You will also have seen the other error message END OF FILE when the short program was run. Why did that happen?

First some history. One of the file types is MDRIVE. This emulates a microdrive. Here the first 9 bytes of data in the file are as described as above. Other file types such as basic or code also copy these 9 bytes into the directory. The bytes in the directory are only used for building the full CATALOG listing. When OPENTYPE files came along the first 9 bytes of the file were dropped as no longer needed.

So when you OPEN# a file the spectrum knows how long it is by looking at the directory. It then subtracts 1 from this length for every character read and when it gets to zero it claims the end of file has been reached. If you try and read another character you get the END OF File error. But you can trick it.

Run the short program again but when you get the end of file error type GOTO 30 as a direct command and as if by magic the last 9 bytes of the file appear. That is because zero - 1 = 16777215. Of course the PLUS D would get hopelessly lost if you let it continue reading past the end of the file.

If you need a program to read a file and not stop when the end of the file has been reached then you can try the following code fragment (as published in Format issue 1)

```
2000 REM STN = stream number
2010 REM CL = characters left to read
2020 LET OFFSET = PEEK (23574+STN*2)+2
     56*PEEK(23575+STN*2)
2030 LET CHANADR = PEEK (23631)+256*PE
     EK(23632)+OFFSET-1
2040 IF CHR$(PEEK(CHANADR+4))<>"D" THE
     N PRINT "Not a disc file": STOP
2050 LET CL = PEEK (CHANADR+31)+256*PE
     EK (CHANADR+32)+65536* PEEK (CHAN
     ADR+18)
2060 RETURN
```

Now your program can test if there are any more characters left to read before doing it and so avoid the END OF FILE error. Smart readers will also see how it would be possible to fix the count to allow for the extra 9 bytes at the start of some files.

A few people have mentioned problems with the version of the +sys file they use with the PLUS D. The current latest version of the +sys file is 2A.

This is more recent than version 3.

Way back in issue 1/8 an update was given to fix a problem with the +2 full screen editor. BUT in issue 1/11 an update was given to change version 1 and version 2 to version 1a and 2a (there is no difference between 1 and 2 apart from the addresses of the rom routines - G+DOS 1 works with ROM version 1 and G+DOS 2 works with ROM 1a) this includes the +2 editor fix but also fixes a number of other problems and creates a new hook code to open and close streams from machine code. So +sys 3 does not have these other fixes.

At some point someone at MGT used this to update version 2 to version 3 and some tapes were sent out before the error was spotted.

However Malcolm Perry, who had this problem, has come up with a fix. If you perform the update of 2 to 2a on a copy of +sys 3 you are left with only a few differences. I haven't tried this but he gives the following pokes to convert +sys3 after the update to true +sys 2a.

```
FOR X=6628 TO 6639: POKE @X,0: NEXT X
POKE @6655,11: POKE @110,67
```

```
POKE @117,192: POKE @119,64
SAVE d*"+SYS 2A" CODE 8192,6656
```

THANKS MALCOLM.

For us DISCiPLE users the correct version of sys is 3d. This is the only one that has all the bug fixes and new features.

E.H.Cooke-Yarbourgh has come across a Spectrum ROM bug that was pointed out in issue 2/7. He wants to print out the time as HH.MM by using the line:-

```
LET t$=STR$ ht+ STR$(mt/100)
```

and has discovered that only the second part prints.

A simple fix would be to use

```
LET t$= STR$(ht+mt/100)
```

You may be interested to know that the first example would not work on SAM either as SAM insists on putting a zero in front of the decimal point.

Malcolm is also having problems with hook code 67 (print cat). I'm not at all surprised as you had been using +sys 3. Now that you have +sys 2a it will work as described in issue 2/3. Other versions can only print a complete directory. The DISCiPLE can not CAT to an OPENTYPE file because a PUSH and POP IX was missed in the ROM code. But the PLUS D can send the CAT to any stream of any type. ie SSTR1 can be any number 1 to 16 as long as the stream is already open.

Richard Salt of Swindon has a problem that I have also had, how to print via stream #3 to a disc file. This was a great oversight on the DISCiPLE and PLUS D as it was a feature that is used a lot on Microdrives. The problem is that the DOS overwrites the Chans information for channel 3 (the printer channel) 50 times a second. So if you try to OPEN #3;d1"print" OUT the channel is corrupted almost immediatly.

However if you set up your interface to use the ZX printer by POKE @11,1 then channel 3 is left alone. You can now OPEN #3;d1"print" OUT. But you can't close it!.

Now if you are prepared to do a little work you can get the data onto the disc and read it back. First you need to create space for the print file by doing this:-

```
OPEN #4;d1 "print" OUT
DIM A$(510)
FOR N = 1 to ????
PRINT #4;A$;
NEXT N
CLOSE #*4
```

where the ???? is the amount of space that you want to save.

Now OPEN #3;d1"print" OUT and you will get the overwrite message.

Load and run your program. Then do:-

```
DIM A$(510): PRINT A$: CLEAR #
```

Use any method you like to recover the file, there have been a few published in FORMAT.

Now run the following program

```
10 OPEN #4;D1"PRINT" IN
20 OPEN #5;D1"PRINT1" OUT
30 PRINT #5; INKEY$ #4;
40 LET STN=4: GOSUB 2000
50 IF CL THEN GOTO 30
60 CLOSE #*
70 STOP
```

Add the subroutine given earlier but alter line 2050 to read:-

```
2050 LET CL=PEEK (CHANADR+551)
```

This will cause some extra to be written at the end of the file but you can edit that out.

The way this works is to trick the PLUS D into writing stream #3 to the disc. Then copying that data to a new stream until the last sector has been copied. It has to be done this way as there will not be a correct file length held in the directory.

It is a bit perverted but I have used it several times successfully.

A plea for help from a Sam owner in Meopham Kent. Nigel Sewell has been using a "dodgy" tape recorder on his Spectrum for many years but has got around the problem of bad recordings by using Eveshams Micro Interface. Now he has a Sam and can't get it to read any of his tapes. Is there a PLUS D or DISCiPLE user near by who could help him to snapshot his programs so he can then load them into the Sam? If so his phone number is 0732 822730.

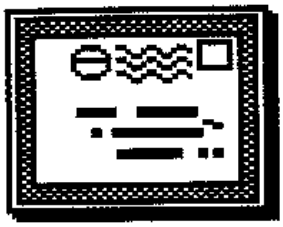
And finally Brian Ralston has been sold a spectrum +2A by a nasty high street store. Can anybody supply a source for a fixer board so he can run his DISCiPLE? I know MGT stopped making them when they stopped making the PLUS D. If you write to me I will forward your letters to him.

And very finally, Debu Dutta of Bombay. To answer your first problem see the glitch report in the March issue. For your second problem SD Software has a utility that will convert MD Files to ordinary files and back again. It was written for use with the OCP assembler but should work OK to convert your Tasword 128 files. The cost is £6.50 and that includes postage to anywhere on the planet.

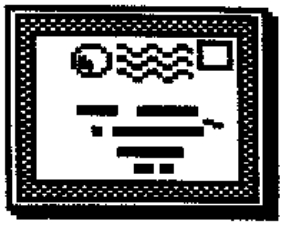
Well thats all for this month. Keep your questions coming. I will answer as many queries as possible but **ONLY** through the magazine. It is in your interest to send me as much info as possible such as program listings etc. Contrary to popular belief I do not have a vast library of programs, I only do this in my spare time!

Write ONLY to Nev Young at:-

FORMAT Help Line,
3, Mitchell Place,
Falkirk,
Stirlingshire,
Scotland, FK1 5PJ.



YOUR LETTERS



Dear Editor,

As a new subscriber to FORMAT, and novice at computing, I would like to thank you for your publication and it's contents. I can see from the first two issues I have received, it will build into a priceless reference library for me, I shall be ordering back issues, of course.

My experience with computers is very limited at present and due to my job (I am a long distance trucker working abroad) it will probably take sometime to improve. I have an ambition to produce a graphic adventure based on, and incorporating the joys (not so many) and the pitfalls (very many) of, the job I do. However this ambition requires more programming experience before it can be fulfilled.

A friend introduced me to computers in November last year, he has a Spectrum+2, I got hooked, not only on playing the games but typing in programs he had in a paperback he bought. As you no doubt know because of the reproduction of print-outs in such books very few programs RUN first time and I got a great deal of satisfaction from rectifying them. Do you know of any similar books? If so, perhaps you could publish the titles in FORMAT. I found a couple in my local Libarary but they, nor W.H.Smiths, can help me with titles available and I don't know who else to ask or how to find out.

I have a SAM Coupé with single Disc-Drive, STAR LC10 printer and a second hand 48K Spectrum. With regard to the Coupé I am experiencing problems obtaining a printer interface as M.G.T. have apparently introduced middle-men into the distribution system causing all sorts of credit worthiness problems for the retailers. I am at present about 8 weeks patient, and this only because 8 weeks to a driver who's away all week is only 16 days down-time, for anyone else it would be 56 frustrating days (by the way, I paid up-front). I would dearly like to purchase a second Disc-Drive but am reluctant to do so until supply has improved.

Thanks once again for FORMAT.

Yours sincerely Derek Piggott.

There are very few Spectrum books left on the market these days but you should be able to pick-up some second hand. Try going to one of the All Formats Shows in London, there are often lots of books on sale. And good luck with your programming.

On the subject of the SAM Coupé Printer interface I can be a bit more positive. FORMAT is launching its own interface in September at a price of £14.95 (see next months issue for order form) and I'm sure this will solve your problem. Also you will find SAM disc drives advertised in this issue so thats another problem solved - I am doing well this month. **Ed.**

Dear Editor,

I am writing to let you and your readers know about 'Piped', the new game available only on the Sam Coupe. It costs £3.00 on tape and £3.50 on disc. Cheques or cash to:- N.Pointon, 31 St.Teilo's, Watford Farm, Caerphilly, Wales, CF8 1FA.

Yours sincerely, Neil Pointon.

We are going to start listing new releases for both SAM and the Spectrum. If anyone has a new product then send us a copy together with the price and other details and we will give it a mention. **Ed.**

Dear Editor,

In the June issue of FORMAT there was a letter from Alan Miles which stated that Rockfort have ceased production of the DISCiPLE interface. My DISCiPLE was in for repair at Rockfort at the time and turned out to

be unrepairable. Rockfort assurd me that they do still manufacture DISCiPLEs and had just ordered some new parts for them. They allowed me a generous trade in value on my old one and a few days later the new one arrived. I hope this clears up any misunderstanding.

Yours sincerely, E.Kliner.

Rockfort Products have not had a licence to make the DISCiPLE for some time now. MGT have been in a long running dispute with Rockfort over unpaid royalties and other expenses. The most important components of the DISCiPLE, the two PAL chips are only available from Bruce Gordon who now owns the copyright and other intellectual property rights relating to the PALs and the DISCiPLE. I can only assume that Rockfort are still selling of the old stock they had when the dispute broke-out. In short, what Alan Miles said is true, the DISCiPLE can no-longer be produced by anyone until the legal dispute is sorted out.Ed.

Dear Editor,

With reference to the recent readers letter 'Where can I get a copy of the spectrum ROM ?' If it is of interest to any reader I have a 'poorly' 48K spectrum, with a video fault, going cheap (say £12) which would provide an answer. Everthing seems to work OK but I get interference dots on screen.

I also have a 'very ill' 48k Spectrum which has a dud keyboard and no colour, but with a bit of dexterity with a wire jumper on the key board sockets it should perform and is even cheaper at £5.

Anyone interested can contact me at 216 Marlpool Lane, Kidderminster, DY11 5DL.

Yours sincerely, Malcolm Perry.

Thanks Malcolm, I'm sure someone out there can make use of your scrap machines. Remember dear readers, even you junk could be valuable to other people. So, don't let things go dusty in some dark cupboard, stick an advert in FORMAT and pass it on to someone who needs it Ed.

Continued from page 18.

usual place, the DOS is at 16384, normal RAM is 32768-49151 and ROM 1 at 49152-65535. This means that you can examine any ROM or DOS routines at any time with no problems about paging ROM 1 in or out or copying the DOS to below 65535. The program takes care of it all.

I think the quality a good assembler/disassembler needs could be called unobtrusiveness - it should simply stay in the background making life easy, and letting the user concentrate on writing the program or studying the one being disassembled. This program has that quality. It is very clearly the work of a man who both knows what a programmer needs in an assembler and has the programming talent to deliver the goods. I think it will probably become the definitive SAM machine code package. It is certainly the one for me.

WRITING for FORMAT

FORMAT is something special. It is written by it's readers, not by a bunch of hack writers. We are always on the look-out for articles and programs to publish in these pages. Articles can be on any computer-related subject not just the Spectrum or the SAM Coupé. They can be just half a page, a long series, or any length in between.

Don't worry too much about spelling (the Editor can't spell either) or layout, we will sort things out for you. Just put it down as clearly as you can.

It is best if you send your article as a word processor file, on disc or tape, but please include a printed copy so we can look at it straight away. Pack any pictures flat or better still include SCREEN$ files so we can print them out here.

Send your work to our address on page 3 or give us a ring on 0452-412572 to talk about it.

SMALL ADS SMALL ADS SMALL ADS

FOR SALE open to sensible offers! Currah Micro Slot, Kempston 'E' printer interface, ZX Printer and paper rolls, 128K Multiface, VTX5000 modem, Joystick interface. Owner sold Spectrum and bought a SAM. Ring [Broadstairs-Kent] 0843 63652

DISCiPLE (3C) + Graphics / Hacking / Poking progs (worth £25) + 5¼" SS/DD drive (needs attention) + 10 discs (used but sold as blank). £80 o.n.o. Also Kempston Centronics printer interface £10, Alphacom 32 printer + paper £10. Phone 0477 35533.

BOOKS FOR SALE Supercharge Your Spectrum; Spectrum Machine Language For The Absolute Beginner; Introducing Spectrum M/Code; Spectrum Basic Programming, Original 36 copies of FORMAT. Offers: John Webb, 13 Broadwater Down, Tunbridge Wells, Kent, TN2 5NJ.

WANTED MGT 'Two-Face' for Spectrum in good condition and with instructions. All offers considered. Phone 0709 365879 and ask for Richard.

FOR SALE DISCiPLE, PLUS D, MGT 3½" 80 track DS/DD drive, MGT 5¼" 40/80 track DS/DD drive, VTX5000 Modem, Voyager Modem, 128K+ Spectrum, £200 the lot or will split. Phone Gordon on 0276 32498.

SAM OWNING Computer Freak looking for pen pals to swap programs, hints and tips. Don't Hesitate, get pen and paper now and write to Mattias Danielson, Storgatan 89, S-51600 Dalsiotors, Sweden.

PRINTERS FOR SALE Both new and boxed. 1 Brother HR15 Daisywheel Printer complete with Manuals, Spare ribbons and daisywheels, £199. 1 Epson FX850 Heavy Duty Dot Matrix printer (ideal for office), Centronics and RS232 inputs, no manuals, £225. Contact Bob Brenchley on 0452 412572.

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Due to the collapse of our local material supplier we are unable to supply readers with the SAM Coupé Dustcovers advertised in recent issues.

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If any reader knows where suitable material can be found we would like to hear from them.

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