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21 EAST MIDLANDS ○ DONINGTON  
PARK, M1, J24.

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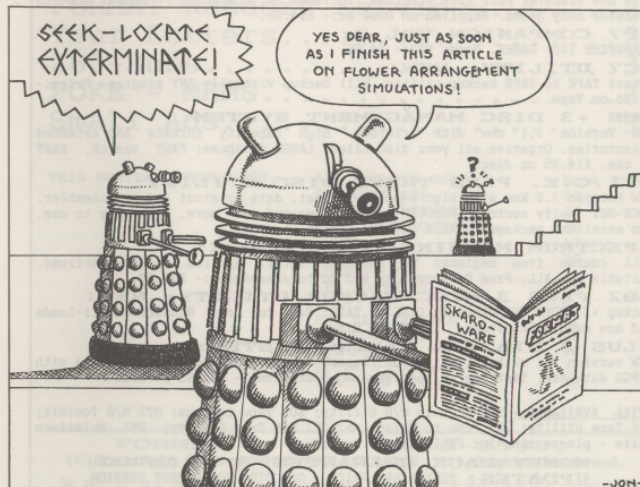
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Vol.5 - No 6.

February 1992.

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## MODULA-2 FOR SPECTRUM

Mira Software have announced the first Modula-2 compiler for the Spectrum. It is the third compiler Mira have produced for the Spectrum, following as it does those for Pascal and Fortran, and is by far their most advanced.

Modula-2 was invented by Niklaus Wirth (who also invented Pascal) and was designed to be more flexible and better suited to writing larger programs than Pascal was.

The Mira Software compiler is available for all versions of the Spectrum from 48k right up to the +3. It is compatible with DISCIPLE, PLUS D, Beta and Discovery disc systems and with Microdrive and Wafadrive. The compiler is a very full implementation and includes a built in editor and an extensive library of routines and programs to get you started.

Priced at just £20 it comes on DISCIPLE/ PLUS D 3.5" disc or on tape for transfer to other systems. For more details send an SAE to Mira Software, 24, Home Close, Kibworth, Leicestershire, LE8 0JT.

## SAMCO TO PUBLISH SPECTRUM SOFTWARE

Sam Computer Ltd have decided to move into Spectrum software market. The move is seen as a way of attracting customer loyalty from Spectrum users which will lead to more sales of the Sam Coupe.

Alan Miles told FORMAT that SAMCO were looking for new and original software for the Spectrum. He went on to stress that the move would lead to more software for the Sam as well, because SAMCO would be able to attract more programmers. Alan is looking for originality - something most software companies have been ignoring in recent years.

As several leading software companies, including Ocean, have hinted that they will not be releasing

new full price titles on the Spectrum in 1992 any new software producer can only be seen as a good thing.

## MUSIC WRITERS ANONYMOUS

Music Writers Anonymous is a new club for users of the Music Writer program produced for the Spectrum by Garry Rowland.

MWA provides a swap shop for music files, there are no membership fees and each set of around eight songs costs £1 on tape and £3 on disc.

You can find out more by contacting Garry Rowland, P.O. Box 49, Dagenham, RM9 5NY.

## MANIC MINER FOR SAM

The all-time classic Spectrum game MANIC MINER has now been released for the SAM Coupe by Revelation. While true to the original the SAM version has improved graphics and sound plus many more levels.

MANIC MINER was originally released for the Spectrum in 1983 and was an instant success. It was one of the early Spectrum games that was truly original and bore no relation to any arcade machine of the time. The game has sold hundreds of thousands over the years and is still available in many budget outlets so few Spectrum owners do not have a copy (legitimate of otherwise) in their collection).

The SAM version is priced at 9.99 on 3.5" disc. For more details ring Revelation on 0792 700300.

News Credits: Tim Davis.

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Saturday 14th December 1992 started as a very cold and very, very foggy morning. The paths and roads were slippery and visibility was down to about 10 yards. Lacking the common sense to turn over and go back to sleep I set out for the All Formats Show in London. What a disaster. No, not the show - the trip. From Gloucester, dead slow because of the ice and fog, over the top of the Cotswolds to Swindon and onto the M4. Just a few miles further and the car starts to lose power. Into the services at Membury and call the RAC. No luck - car needs major surgery - so can the RAC find us a hire-car? Yep, after RAC control has spent half an hour phoning round the Swindon area a car is found at last - the other side of Swindon (20 miles back the way we came. So its off to the west bound services (towed by the RAC) and wait for a taxi to take us to the waiting car, time now 9.30am - just about the time we should have been in London setting up at the show.

Now I went go on to explain about the taxi skidding on black ice and crashing into the curb, nor about the garage taking nearly an hour to get the hire car sorted out, nor the traffic going into London being reduced to 15mph because of the fog; ice; and broken-down vehicles. Just suffice it to say that by the time I did arrive at the show around 12.45pm I really wished I had stayed in bed.

To all of you who braved the weather and got there early - I'm sorry I missed you. Still, one good thing, Bruce Everiss was feeling so sorry for me that he decided to give me a second batch of £1 off vouchers to send out to UK members and you should find one

enclosed with this issue.

OK, OK, I give in. For all of you who phoned or wrote following the pictures in the December issue, here are the identities of our youthful bunch. Page 20, reading from top left, Carol Brooksbank, Sandra Byford, Jon Nixon and Jenny Bundock. On page 21 you will find Nev Young, Me, John Wase, and my daughter (she hates me for printing that one). You should now be able to match the pictures to those in the January issue - and yes I know I used the same picture of Annemarie in both issues, that was my idea to cause a little confusion. And to all of you who commented that my photo in the January issue was a good likeness - get some new glasses, I'm far more handsome than that.

Now for some very sad news. I'm sorry to have to report the death of Murial Gaff in the early hours of Monday the 6th of January. Many of you, especially those who regularly attend the All Formats Shows in London, will have had the pleasure of meeting Murial, known affectionately to most of us as "Brian's Mum". She was always to be found there, whenever Brian Gaff was in attendance with B G Services. Her sad death, from a brain hemorrhage, came as a great shock to us all. Her warm and friendly nature and the great support she gave Brian made her many friends and she will be missed by all who knew her. I am sure you will all join me in passing our condolences to Brian.

Finally, next month will see the first of a new series dealing with transferring Spectrum games to disc. Don't miss it.

Bob Brencley, Editor.



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- \* SUPERB UPDATE SERVICE
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# SHORT SPOT

By:- John Wase.

Greetings from Manchester - No: I've not moved - just writing this in the odd bits of time I've got spare at the Annual ICNE Research Event. As usual, I start with a red face and a bloodied nose. It's an item on the Spectrum. I cannot do better than quote from a highly indignant R. H. Doughty, who writes as follows... "Dear Dr. Wase... You referred in the December issue of FORMAT, to a letter from Alan Cox of St. Clears, Dyfed, and also to a very short program I included in a letter to Ken Garroch of the now defunct "Popular Computing Weekly", back in 1988, but I do not have the original article which prompted it. Your comment was "as the program didn't work, he corrected it". Although I am approaching my 77th birthday, and am undoubtedly losing brain cells fast, I maintain that the program did work as I typed it. My sin was that I used lower case L which is easily confused with the number one and may have led to an error elsewhere".

My apologies: I quoted direct from Alan, although do not doubt that by the time he had transcribed it, it failed. Firstly, this highlights once again the problems which arise from using the number one and lower case L in the same program to mean different things. So don't, particularly if you are a "Short Spot" contributor. Secondly, it emphasises the many opportunities there are for mauling your Basic masterpiece before it appears in print: specifically, the liberties "Popular" composers used to take with one's carefully wrought contributions. At best, they were likely to have turned both the lower case L and the number one into capital I all the way through: at worst, they would compound this by missing out a line or two. It's probably worth repeating Mr Doughty's program (I've used capital L as a variable, though).

Here it is...

```
10 FOR N=1 TO LEN L$
20 IF CODE L$(N)<123 AND CODE L$(N)>
96 THEN LET L$(N)= CHR$ (CODE L$(
N) - 32)
30 NEXT N
```

Many thanks, Mr Doughty, and thanks, also, to your Spectrum for its Christmas card. And can I thank those others of you who also sent me an embarrassingly large number of cards; too many to reply to.

We now move to Tasword 2, either on Spectrum or SAM, and a real "one liner" from Clyde Bish of Exeter, whom many of you know already. Clyde's son had a project which demanded production of printed material, essentially as a newspaper, with headlines and inclusion of some pictures and clipart. This line of Basic adds a touch of DTP-type class by taking your Tasword file (typed to a width of 20 characters, and with a maximum length of 180 lines) and reformatting it to three columns. newspaper style, each of 20 characters wide, and with two spaces between columns. Here it is...

```
9999 LET I=32022: FOR F=35840 TO 39679
STEP 64: FOR N=0 TO 19: POKE I,
PEEK (F+N): LET I=I+1: NEXT N: LE
T I=I+44: NEXT F: LET I=32044: FO
R F=39680 TO 43283 STEP 64: FOR N
=0 TO 19: POKE I, PEEK (F+N): LET
I=I+1: NEXT N: LET I=I+44: NEXT
F
```

Wow... Some line! If you want a banner headline and illustrations (as Clyde's son did in the project which spawned this routine) then just leave appropriate spaces (bearing in mind that each column is formatted to 60 lines). Print the text, then run the paper through again with the clip art,



etc., in place. "It does work. Honest!" So says Clyde: complaints to him, not to me! Clyde also mentions that if you do make a mistake with the spacing, there's no need to panic. The file is copied into the middle and right columns, but the original is not itself destroyed. So if it doesn't come out in the way you need, just alter the spaces appropriately in the original column and call it again: it overwrites your first attempts. Only when you are completely happy do you erase the original.

Clyde suggests that you merely press B from the main menu to enter Basic and run the line. However, if you are technically minded, this line is to your liking and you don't possess PGC's program, you can easily make things more permanent by adjusting the main menu and finishing with a call to the text editor. A Tasword 2 file is held as a string of ASCII characters beginning at address 32000 and reading across each line including any spaces. 32022 is the on-screen position of the top left character of the middle column, and 32044 starts the right hand column. 35040 is the address of the character at the beginning of line 61 which will be moved to the top of the middle column, and, similarly, 39680 is the equivalent address for line 121 which will start the right column. You could quite easily rewrite the line for a two column display, or even a wide column/narrow column format once you've calculated the start point for PEEKing and POKEing. You will, of course, also have to alter the length of the N loop and the value added to I between the NEXT N and the NEXT F.

Many thanks Clyde. Clyde also mentions that he'll let me have a word-counter in due course. Look forward to hearing from you.

Over now to Istvan Ordog of Budapest. Istvan, too, has a Tasword 2 add-on; rather more novel this time. It's an ABC sort, and Istvan mentions that this is derived from an original published in the "Happy Computer" in October 1986 and written by H.Jostkleigrewe. The program sorts

each line from a given START to an END line according to the usual ASCII code. If a line starts with a margin or space, then its code is 32. The length of this program is a mere 81 bytes, and it will sort 180 lines in 20 seconds. It was left small deliberately to fit in, but because it is so small, there is no error trapping. So DON'T:-

- i) Give it a bigger number for END than for START
- ii) Give it a minus number
- iii) Give it a number greater than 320 for END (there's only 320 lines in the Tasword 2 text file).

Or you'll crash the program. And it'll serve you right. To install TWSORT, take your precious Tasword 2 disc and copy it onto a new disc. Leave this not write protected, and load Tasword 2 from it. Stop by going to the LOAD/SAVE command and pushing "BREAK". Type in the lines given in program 1 (or merge them in from a disc containing a pre-typed file if you prefer). Save the new Tasword 2 (with the additional lines) over the old one. O.K. so far? Now remove temporarily the disc (just in case) and reset your computer (or reset the Spectrum emulator in SAM).

Type in program 2 and replace the disc in the drive (take care with line 30). Run program 2, and if it is correct, the additional code patch will also be saved to you disc in drive 1. To use it, select "a" from the main menu, and answer the questions, giving the start and end lines for your sort. Panic now sets in, says Istvan, for the program loads the code file into the screen buffer, since there's no room over RAMtop. Panic not; sit there in hope, and if all is well with your code, the original screen will return. Here is the first program...

```
27 PRINT "ABC sort ";TAB VAL "31";"a
"
105 IF b=VAL "97" THEN GOTO VAL "8E3"
115 IF b=VAL "97" THEN LET i=VAL "5"
8000 CLS : PRINT AT n,VAL "14"; INVERS
E e;"SORT"
```

```
8010 LET j0=VAL "20": LET i=VAL "5": P Back to SAM, now. Kevin Allen, of
RINT AT i,i;"First line (1)": GOS Longside Halls, University of
UB VAL "6E3": IF LEN a$=n THEN LE Bradford, has written. Well, sort of -
T a$="1": PRINT AT VAL "5",VAL "2 he asks me to boot the disc. Please;
0": "1" it's so much easier for me if I have a
hard copy, rather than having to
8015 LET sz=VAL a$ stumble across my little, overstuffed
8020 LET aa=VAL "32000"+(VAL a$*VAL "6 garret to stare at SAM's screen, then
4")-VAL "64" back to type. His first item concerns
PRINT USING, which Istvan also
8030 LET ez=a/VAL "64": PRINT AT VAL " mentions. No, I don't want to start
7",VAL "5";"Last line ("ez;")": that one off again. Fact is, though,
LET i=VAL "7": GOSUB VAL "6E3": I that Kevin draws attention to an
F LEN a$=n THEN LET a$=STR$ ez: P interesting quirk of SAM's ROM which
RINT AT VAL "7",VAL "20":a$ is worth further thought. Do you all
8040 LET zz=VAL a$-sz: IF zz<n THEN G have this feature? Any comments from
OTO VAL "8E3" Andy Wright? Here's Kevin's program...
```

```
8050 CLS : POKE VAL "16384",aa-VAL "25
6"*INT (aa/VAL "256"): POKE VAL "
16385",INT (aa/VAL "256"): POKE V
AL "16386",zz-VAL "256"*INT (zz/V
AL "256"): POKE VAL "16387",INT (
zz/VAL "256"): LOAD "m";e;"TWSOR
T"CODE VAL "16400": RANDOMIZE USR
VAL "16400":
8100 CLS : GOTO VAL "25"
9998 STOP
9999 SAVE d1"TASW.SORT"
```

And here is the second program...

```
1 REM *****
2 REM ** Tasword2 sort code**
3 REM *** Istvan Ordog ***
4 REM *** Hungary/Budapest***
5 REM *****
10 CLEAR 49999
20 LET c=0
30 LET is="0220011222540002000420020
642210420000640220001241812540000
402370432212290060642211260642211
900000560110400020240332210350162
402410242262212250060642211260002
452211260642211190002412211190642
210350162380220010242002212250060
64221035016252024190"
40 FOR i=50000 TO 50080
50 POKE i,VAL i$(1 TO 3)
60 LET c=c+PEEK i
70 LET is=i$(4 TO )
80 NEXT i
90 IF c<8961 THEN PRINT "ERROR!":
BEEP 1,1: STOP
100 SAVE "m";1;"TWSORT"CODE 50000,81
9998 STOP
9999 SAVE d1"twsortmc"
```

Many thanks, Istvan: nice to hear from you again.

```
10 REM A continuation of PRINT USIN
G maybe? ....
20 FOR n=-1000 TO 1000 STEP 150
30 PRINT "...;FN nform$(n,7," ");".
"
40 NEXT n
1000 DEF FN nform$(n,c,l$)=STRINGS((c
-LEN STR$ ABS n) AND (LEN STR$ AB
S n<c),l$)+STR$ ABS n+(" " AND S
GN n=-1)
1010 REM Curiously, this function can
also be called with something li
ke FN nform(10,5,"-") i.e. with n
o $ in the name; a ROM bug me thi
nks?
```

His next offering is a rather nice little program called "lines" which doodled. Or did, after I'd made it work. Here we come to an embarrassment. My SAM has ROM 3. This week, I've discovered that I have one of the first five with a bug in the array handling routines. (This bug is unique to this issue, and is not in ROM 2). No-one bothered to tell me, and a number of non-running programs where I've cussed at the programmer (particularly filing programs) are non-runners due to this bug. Kevin's "lines" at first didn't work for me until I'd changed "MODE 4" to "MODE 3". Later, it ran fine. Maybe it'll work for you, else change line 10. Here it is.

```
10 MODE 4: CLS #
20 CSIZE 8,8
30 LET i=1
```



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Q. WHAT IS PRO-DOS?

A. PRO-DOS allows you to run most CP/M 2.2 programs on SAM.

Q. OK, so what is CP/M 2.2?

A. CP/M 2.2 is a Disc Operating System, originally invented by Digital Research, that gives many different machines the ability to run the same programs. This means that a vast pool of software already exists for PRO-DOS.

Q. What sort of programs, and where do I get them?

A. Well, in the main, the available software is for serious uses. There are Wordprocessors, Spreadsheets, Databases, Programming Languages, Utilities and Assemblers available in the public domain, which means they are cheap! You get a taster of what is around by ordering the sample PD disc (over 700k of software to play with and it only costs an extra £1) when you order PRO-DOS. A contact for other PD discs will also be supplied.

Q. Fine, but what will PRO-DOS cost me?

A. PRO-DOS, with a 68 page manual, Boot and System utility discs, costs just £28 plus £2 p&p (UK). The PD sampler disc costs only £1 if purchased at the same time.

**B.G.SERVICES (Brian Gaff).**

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```
40 INPUT "Spacing (try 4) ";m;"Numb
er (try 8) ";l
50 DIM prev(1,4)
60 LET prev(1,1)=0,prev(1,2)=0,prev
(1,3)=0,prev(1,4)=0
70 LET xmin=10,xsmax=245,ysmin=10,
ysmax=165
80 LET xmin=51,xsmax=194,ymin=51,
yemax=124
90 LET dxs=1,dys=1,dxe=1,dye=1
100 LET xs=0,ys=100,x=100,y=0
110 DO
120 PEN RND(6)+9
130 PLOT xs,ys: DRAW TO xe,ye
140 PEN 0: LET ind=(i MOD 1)+1: PLOT
prev(ind,1),prev(ind,2): DRAW T
O prev(ind,3),prev(ind,4)
150 LET prev(ind,1)=xs,prev(ind,2)=y
s,prev(ind,3)=xe,prev(ind,4)=ye
160 LET i=i+1
170 LET xs=xs+dxs*m,ys=ys+dys*m,x=xe
+dxs*m,y=y+dys*m
180 IF xs<xmin THEN LET dxs=-1
190 IF xs>xmax THEN LET dxs=1
200 IF ye<ymin THEN LET dxe=-1
210 IF ye>yemax THEN LET dxe=1
220 IF ys<ysmin THEN LET dys=-1
230 IF ys>ysmax THEN LET dys=1
240 IF ye<ymin THEN LET dye=-1
250 IF ye>yemax THEN LET dye=1
260 LOOP
```

While we're on the subject of oldies, remember Bigletters? Here's a new approach; again from Kevin - largeletters. Type it in and see.

```
10 MODE 3: CSIZE 6,8: CLS R#
20 DEF FN charset=DPEEK SVAR 566+25
6
30 LET zero=SVAR 4,one=SVAR 3
40 LET is=""
50 LET base=FN charset
60 POKE zero," "
65 LET s$="Hi There!"
70 EDIT "String (eg Hi There!) "; L
INE s$
80 FOR b=0 TO 7
90 FOR l=1 TO LEN s$
100 POKE one,s$(l)
110 LET addr=base+b+(CODE s$(l)-32)*
8
120 LET is$=is+BINS (PEEK addr)
130 NEXT l
140 PRINT is$: LET is=""
150 NEXT b
160 STOP
170 FOR a=FN charset TO FN charset+2
```

56 STEP 8

```
180 FOR b=0 TO 7
190 PRINT BINS (PEEK (a+b))
200 NEXT b: PRINT
210 NEXT a
```

Super, isn't it... Many thanks, Kevin.

Let's stick with SAM a little longer. Daniel Rigo of Marchienne, Belgium, sends me a little snippet here. Normally, I wouldn't dream of printing an automenu front end to load your programs (I get sent a dozen a month), but Daniel's approach to this problem is not to use a menu; it's therefore quite novel. Daniel has made a valiant attempt at an English explanation: I hope I have not lost anything in the bits I have translated. As I understand it, you add these lines somewhere in the "auto" file...

```
5 REM ***** REDEFINITION TOUCHES*****
6 REM *****DANIEL RIGO - BELGIUM*****
10 DEF KEYCODE 199: DIR 1
20 DEF KEYCODE 200: DIR 2
30 DEF KEYCODE 192: LIST :
40 DEF KEYCODE 198: INPUT "PROGRAM
NUMBER TO LOAD "; A: LOAD A
50 DEF KEYCODE 193: INPUT "GO TO LINE
NUMBER ? "; L: GO TO L
```

This redefines the function keys as follows:

```
F7 = DIR 1
F8 = DIR 2
F6 = LOAD INPUT PROGRAM NUMBER
F0 = LIST (WITHOUT "ENTER")
F1 = GO TO INPUT LINE NUMBER
```

Once you've run this program, you merely stuff a disc into drive 1 and press F7. O.K., so it's that file. Press F6 and the program number. It loads. Nice one, Daniel. Many thanks.

Back to the Spectrum now, with G. Jackson of Creigiau, Cardiff, who has written in to sympathise with all those readers who have not yet been able to afford Andy Wright's wonderful "Beta Basic" program, yet who still hanker after Ettrick Thomson's clock. So Mr. Jackson's provided a listing to



do the business: the clock, that is; not "Beta Basic".

```

9000 IF NOT CK THEN POKE 23674,0: POKE
23673,0: POKE 23672,0
9010 LET T1=(PEEK 23672+256*PEEK 23673
+65536*PEEK 23674)/50
9020 LET T2=(PEEK 23672+256*PEEK 23673
+65536*PEEK 23674)/50
9030 IF T2>T1 THEN LET T2=T1
9040 LET HR=INT (T2/3600): LET MIN=INT
((T2-3600*HR)/60): LET SEC=INT (T
2-3600*HR-60*MIN)
9050 INPUT ": PRINT HR;";MIN;";SEC
9060 RETURN

```

That's the subroutine, then. Got it typed in and safely saved? Fine: now start at time zero with "LET CK=0: GOSUB 9000" to show elapsed time (up to about 93 hours!).

Mr Jackson mentions that those who doubt the need for lines 9010 and 9030 should REM those lines, altering the POKES 23672 and 23673 in line 9000 to 255. Now type in the following little program...

```

10 LET CK=0: GOSUB 9000
20 LET CK=1: GOSUB 9000
30 GO TO 10

```

It will be seen that the time which should be  $(255+256*255+65536*0)/50$  seconds appears every now and again as  $(25+256*255+65536*1)/50$  seconds. This is because the third PEEK in line 9020 has occurred early enough to leave PEEK 23672 and PEEK 23673 still at 255 (about to go to 0), but too late to find PEEK 23674 still at 0; it's just gone to 1.

Just think about that carefully after a heavy night's partying...

A little light relief, now. Alan Cox of St. Clears, Dyfed, has sent me yet another disc full of bits and pieces - it gets embarrassing, because after I've picked over a disc and selected bits, then Bob's edited some of them out again (to fit the space he has available), I always end up forgetting what I've chosen. Yet, before I can gather my senses and sort out the mess, the nice man (very, very nice

man) has sent some more. Bless him. Here, for a start, are a couple of pictures, suitable for SAM or Spectrum, (but make sure the kettle and coffee are available in the kitchen if you're using the Spectrum for picture 1: it's going to take quite a time).

```

5 REM Picture drawing program base
d on program by Stuart Gibson of
London
6 REM PCN 30 June 1984
7 REM version for SAM
8 REM for Spectrum the limit on f
in line 10 can be increased to 7
4(?). PEN f in lines 30 and 50
should be omitted
9 REM For SAM it is interesting to
use RECORD TO and BLITZ
10 RECORD TO a$
11 FOR f=0 TO 70
20 PLOT f,f
30 DRAW PEN f MOD 7,0,1,f,5
40 PLOT f,150-f
50 DRAW PEN f MOD 7,0,1,f,5
60 PLOT 170-f,f
70 DRAW PEN f MOD 7,0,1,f,5
100 NEXT f
110 RECORD STOP
120 PAUSE : CLS
130>BLITZ a$

```

And here's another one...

```

5 REM Spiral pictures
6 REM based on program by Mike Day
PCN 4 August 1984
10 CLS
20 INPUT "Enter a number ":p
30 FOR n=0 TO 100:p STEP p
40 LET x=128+80*COS n-40*COS (n*p)
50 LET y=88+60*SIN n-20*SIN (n*p)
60 IF n=0 THEN PLOT x,y
70 DRAW TO x,y
80 NEXT n

```

Remember those impossible drawings? here's another along those lines...

```

10 REM Drawing of an impossible obj
ect
15 REM by A D.Cox October 1991
20 GOSUB 200
30 LET xos=128,yos=88
40 LET l=34
50 LET p=2+1+COS (PI/6)
60 LET q=p/3

```

```

70 LET r=2*p
80 LET a=2*PI/3
90 FOR z=0 TO 2
100 PLOT -1*SIN (z*a),1*COS (z*a)
110 DRAW (p+q)*COS (a*(z+2)),(p+q)*S
IN (a*(z+2))
120 DRAW r*COS (z*a),r*SIN (z*a)
130 DRAW (r+q)*COS (a*(1+z)),(r+q)*S
IN (a*(1+z))
140 DRAW (r-2*q-p)*COS (PI+a*z),(r-2
*q-p)*SIN (PI+a*z)
150 NEXT z
160 FILL USING a$,0,1.5*1
170 FILL USING b$,0,2.4*1
180 FILL USING c$,0,-1.2*1
190 STOP
200 LET xos=0,yos=0
210 FOR n=0 TO 15
220 FOR m=0 TO 15
230 PLOT m,173-n
240 NEXT m
250 NEXT n
260 GRAB a$,0,173,16,16
270 CLS
280 FOR n=0 TO 7
290 FOR m=0 TO 7
300 PLOT 2*m,173-2*n
310 NEXT m
320 NEXT n
330 GRAB b$,0,173,16,16
340 CLS

```

```

350 FOR n=0 TO 5
360 FOR m=0 TO 5
370 PLOT 3*m,173-3*n
380 NEXT m
390 NEXT n
400 GRAB c$,0,173,16,16
410 CLS
420 RETURN
9998 STOP
9999 SAVE "impossible": VERIFY "impos
sible"

```

And that's all for now, folks. Please keep the contributions - small ones, please - on a disc if possible, together with a written description, and, if you include Machine code, a Basic listing for code with a decimal poker and, if you have one, an annotated assembly listing. Yes, I know I want jam on it. But you try putting this lot together from some of the bits and pieces that come my way, and you'd be asking, too!

Thank you all for your letters, bouquets, brickbats and comments. Please keep the "Short Spot" pieces coming to John Wase, Green Leys Cottage, Bishampton, Pershore, Worcs WR10 2LX. See you next month.

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# MUSIC MACHINE

## MAKE MUSIC WITH YOUR SAM

Reviewed By:- Carol Brooksbank.

When Alan Miles gave me the review copy of Revelation's SOUND MACHINE, the handbook was not finished, and all he had was a draft of the first half, which he said would "get me started". To be honest, I was doubtful whether I could make sense of such a complex program with only half a handbook. But it is so well constructed and logical that by the time the full handbook arrived I had worked out what almost all of the options do.

Quite simply, the program makes it possible for everyone, beginner or expert, to make full use of the Sam Coupé sound chip for up to six-note chord music and versatile sound effects, without bothering your brain with Philips' incomprehensible soundchip paperwork.

There are two main features, a waveform generator and a music editor, and you can switch between them so long as you save your work to disc before changing. The Samco mouse or keyboard control can be used with either. I only wish the arrow keys were available for keyboard cursor control, instead of or as well as Q,A,O and P.

The waveform generator lets you devise up to ten sounds at a time - tone or white noise - which can be loaded into the music editor and used either for music making, or to combine them into sound effects. There are six preset waveform envelopes, or you can design your own envelope on a simple design screen. You can vary the frequencies, and there is an icon which resets all the frequencies in your sound to a central position. Another icon reverses envelope and frequencies.

You can test the sound at any point, or hear it run through an octave. You

can change octave, pitch and volume. The range of possible sound effects and musical instrument sounds is huge, and the handbook includes a useful section on sound design.

The music editing screen (fig.1) has six octaves of piano keys at the bottom, with a marker showing which octave is current. When you trigger the octave up and down icons, the marker moves and the notes change pitch. Unless you load your own sounds, they are all a continuous organ-type note.

The editing screen is an ingenious grid. Each vertical square represents a semitone pitch, and a two-octave keyboard down one side serves as an index. As the cursor moves up and down the grid, a dot moves to the appropriate note on these keys. When you change octaves the grid moves up or down, taking with it any notes you have already entered. Horizontal squares represent note length. One square is used for the shortest note - longer notes are made by filling in adjoining squares with the same pitch on the same channel. Every time you enter a note on the grid, the square is coloured in and the chord sounds.

There are bar marks, which may be set for three (six in a bar) or four time. Twenty-four notes are visible on screen at once - three four-beat or two six-beat bars if your basic note is half a beat. If you need to vary this you can quite happily ignore the bar marks. The music scrolls off to the left leaving blank bars for adding more. Notes can be inserted or deleted and tempo can be changed. You can play one, two or three bars, or to the end of the music - fast forward, rewind, pause or stop it. As it plays, the chord notes are shown by dots on the piano keyboard below, and the channels



used by a volume indicator which overwrites the grid. Any combination of channels can be muted or active on playback so that you can hear the full music or check part of the harmonies.

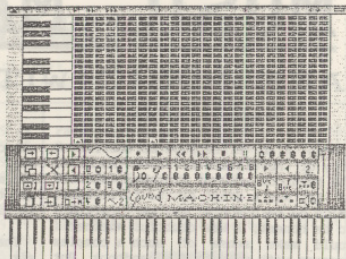
All six sound channels can be used for tone and/or noise, so you could reserve a channel or two for percussion and the others for melody instruments. The channels and sounds are colour coded in the grid, so you can see at a glance which notes use the current channel and waveform. This does not work too well with a black-and-white monitor - some of the colours reproduce in the same shade of grey - but palette changes from BASIC are possible.

Sections of music can be marked as a block, and then copied, deleted, cut-and-pasted, played forwards, or backwards. You can mark a place to which you can return instantly, or you can move straight to the start or end of the current channel's notes. You can even strip out all the notes from one channel.

There are eight memories into each of which the note pattern of one channel in a block can be stored. The notes in a memory can then be added at another point, at any pitch and on any channel - very useful when working with fugues or variations. The memories can be saved/loaded to disc, as can the waveforms in use and the full music.

It is even possible to enter music into the grid by "playing" it - using some Sam keys as a keyboard. This option is just for fun, not for serious composition. If you play a wrong note it gets included, and if you pause for thought a series of rests are inserted. It took me ages to sort the notes and rests I really intended to use out of all those that had appeared on the grid, but I never could play the piano efficiently!

There is a short piece of BASIC and



some machine code on the program disc to enable sounds and music saved to disc from the Editor to be used independently or in your own programs. The music/sounds are interrupt-driven, so they can play on while the computer is doing something else.

This is a first-class program - the first Sam program I have seen which really exploits Sam's facilities to the full. I only want to suggest one improvement. The grid doesn't move as the music plays, and if you hear an error in playback, you have to find the place yourself. It would be useful to be able to move the grid instantly to the point at which you paused the music.

SOUND MACHINE is well presented and packaged - it even comes with a blank disc for saving your own compositions. You can use it with any level of experience, whether you can read music or not. I managed 510 bars in memory at once in the music editor - and if you want more there is nothing to stop you composing in blocks and playing them one after the other. It will be used by everyone writing programs for Sam who wants to include sound effects or music, and by those who just want to use their Sam to make music. It is a superb educational tool, worth a place in any classroom, because the handbook includes an introduction to music theory and notation, exercises in improvisation, and in experimenting with waveforms. Useful, instructional and fun - at £14.99 it has to be the bargain of the year.

By:- Nev Young.

Harry Connell has prompted me to uncover a despicable plot that has been going on for years, since 1972 to my knowledge, about disc drives. Back then when asked what is the difference between a single density disc and a double density disc I would have said "About £40". These days the answer would be "About 40p". Now before the disc manufacturers break down my door and nail me to the wall I had better explain in greater detail.

I will use the 3.5 inch disc as examples. You have a disc, it has two sides, each side has a number of tracks, each track has sectors and each sector holds data. The main thing you need to know about a disc is how much data can you get on to it. Starting at the bottom and working up you have the data which is made up of bytes. How many bytes can you get on a sector? There are (usually) three choices 128, 256 or 512 (1024 is now starting to appear on a few systems).

So, how many sectors are there on a track? Since a track is the same size then it will depend on the size of the sector and how fast it is written to the disc (the data transfer rate). As the PLUS D can have ten 512 byte sectors you would expect to be able to have twenty 256 or even forty 128 sectors. In fact you get less because of the extra hidden data between the sectors. Those with a DISCIPLE will (may) know that the DISCIPLE will work in single density mode where you have ten 256 byte sectors. The overall effect is the number of bytes you can manage to squeeze on to a track. Less than 3K is normally the single density. 3K to 5K is double density and more than 5K is high density. The PLUS D gets 5K onto a track so it is at the top end of double density. The 1.44Mb discs used on IBM & compatibles have 16 sectors, each of 512 bytes,

giving 8K per track. If a disc is sold as DD (double density) it means that it can be used "reliably" to hold 5K per track.

Now, how many tracks on a side? Normally 40 or 80 but it is the disc drive not the disc that determines this. Some old 5.25 inch drives use 35 or 38 tracks per side. If a disc is labeled double track it means it can be used "reliably" in an 80 track drive.

How many sides? 1 or 2. Once more it is the disc drive not the disc that decides how many sides can be used.

Now for the bad news. Many, but not all, disc manufacturers make only double sided, double track, high density discs. But when testing, some may fail to work at high density but be OK at double or single density. Some may fail to work on both sides but be OK on one. Some may fail to work at 80 track but be OK at 40 track. Do the manufacturers throw these substandard discs away? No, they just put a different label on them. Now many people have found that if they buy the very cheap SS/SD (single sided, single density) discs they still work as DS/DD. But do they work "reliably"? Many do because not every disc is fully tested. Possibly only 1 in a 1000 are tested and if it fails the other 999 in the batch are assumed to be failures as well. What you are paying for is really the amount of testing the manufacturer has done on that batch of discs.

So now I hope you know why I say the difference between a SS/SD disc and a DS/DD disc is "About 40p".

Rusty Atkins asks why can he save strings and arrays to tape but only arrays to the disc on a PLUS D. Well



the answer is because of the way the DOS is written. I had a bit of a problem understanding your problem at first as when I tried to save a string it worked, but then I use Uni-Dos. In the other part of his letter he asks if I could explain all about the different file types (11 on the PLUS D). That's rather a tall order but I'll give it a go. Sorry in advance if you end up more confused than when you started.

On the basic PLUS D, and DISCIPLE, there are 11 file types. They are given the following names:-

- 1 Basic
- 2 Numeric Array
- 3 String Array
- 4 Code
- 5 48K Snapshot
- 6 Microdrive
- 7 Screens
- 8 Special
- 9 128K Snapshot
- 10 Opentype
- 11 Execute

Uni-Dos also adds:-

- 12 Subdirectory
- 13 Create

In many ways all the files are the same. They are a collection of bytes written to the disc from the memory of the computer. They have a file header in the directory and a data area some where on the disc that, as you would expect, holds the data. The first thing to know about the files is the directory information. This is not the data of the file but information about it. The first 210 bytes are used for the same thing on all file types and are there to allow the DOS to find the file and know what to do with it. The first 210 bytes of the file header are allocated as follows:-

Byte Use

- |      |  |
|------|--|
| 0    | File Type 0 = erased 1-13 as above. (add 128 for hidden files and add 64 for protected files - Uni-Dos only) |
| 1-10 | Filename   |

- |        |   |
|--------|---|
| 11-12  | Number of sectors in file 0-65535   |
| 13     | Track number of first sector in file  |
| 14     | Sector number of first sector in file   |
| 15-209 | Sector allocation bit map. One bit per sector used. Byte 15 bit 0 indicates track 4 sector 1; Byte 16 bit 3 is track 5 sector 2, and so on. |

As you can see from this the DOS can locate the first sector of a file in two ways. Either by working out from the bit map or using bytes 13 & 14. In fact it uses the latter. To find the next sector of a file the bit map could be used but instead a quicker way is used. Each 512 byte sector used by the file only uses 510 bytes for data. The last two bytes hold the track and sector of the next sector in the file (Apart from subdirectories in Uni-Dos which don't) or 0,0 if it is the last sector of a file. In this way files can be loaded very quickly, as there is no need to do any calculation to find the next sector.

So why have the bit map? This is used when a file is to be written to the disc. First, every file header is read and the bit maps of all live files are added together to make a single map of the total disc usage. In this way the DOS knows which sectors are free to be used, or if there are any left on the disc. I have wandered off the point a bit but the background is needed to understand how the disc is layed out.

In the header bytes 210-255 have different uses depending on the file type. Also in some files the first data bytes have special meanings. The reason there are so many file types is so that the DOS can tell what meaning to apply to the header bytes and the first bytes of the file. As follows (I hope I get this right).

BASIC:-

- |         |   |
|---------|---|
| 210     | Always 0. hangover from tape & microdrive |
| 211-212 | Length of file                            |

- |         |  |   |
|---------|--|---|
| 213-214 | Memory start address (always PROG on load) | MDRV:-  |
| 215-216 | Program length without variables           | 210-255   |
| 217-218 | Autostart line number or 65536 if none     | Not used except on Uni-Dos when they are the same as for a code file. |

These 9 bytes are also the first 9 bytes of the file.

NUMBER ARRAY:-

- |         |  |
|---------|--|
| 210     | Always 1. hangover from tape & microdrive.                           |
| 211-212 | Length of array in bytes   |
| 213-214 | Memory start address (ignored on load)                               |
| 215-216 | Used to be the array name but I don't think it is used on the PLUS D |
| 217-218 | Not used   |

These 9 bytes are also the first 9 bytes of the file

STRING ARRAY:-

- |         |                        |
|---------|------------------------|
| 210     | Always 2. hangover etc |
| 211-218 | Same as numeric array  |

These are also the first 9 bytes of the file.

CODE FILE:-

- |         |  |
|---------|--|
| 210     | Always 3. hangover etc   |
| 211-212 | Length of file in bytes  |
| 213-214 | Memory address used during save. Also used as the load address if none is entered. |
| 215-216 | Not used   |
| 217-218 | Auto run address   |

These are also the first 9 bytes of the file.

48K SNAPSHOT:-

- |         |   |
|---------|---|
| 210-218 | Not used except on Uni-Dos when they are the same as for a code file. |
| 219-255 | Z80 registers at time of snapshot.                                    |

The file is a single code block starting at memory address 16384 and extending to address 65535.

The first 9 bytes of the file hold the same information as the first 9 bytes of file types 1 through 4. After that the data is streamed and is formatted to be the sector header info of a microdrive channel from the header preamble to DESCHK followed by 512 bytes of data and one byte as DCHK. Then the channel and data blocks continue to the end of file. For more info see the microdrive book or the shadow ROM disassembly.

SCREENS:-

This is simply a code file starting at 16384 and 6912 bytes in length. In all other respects is is the same as file type 4.

SPECIAL:-

210-255 Any meaning decided by the programmer.

There is really no such thing as a special file. Rather it is a file that is none of the other types. It can be used for any purpose but I have never seen this file type used as type 10 is more versatile and accessible from basic.

128K SNAPSHOT:-

210-255 Same as for 48k snapshot.

The first byte of the file is a copy of the page byte normally held at address 23388 (BANKM) on a 128K machine. This is followed by 8 16K blocks of data. Each being saved from address 49152 by paging all 8 memory blocks into that area in turn.

OPENTYPE:-

- |         |                                     |
|---------|-------------------------------------|
| 210     | Number of 65536 byte blocks in file |
| 211-212 | Length of last 65536 block          |
| 213-255 | Not used                            |



The file begins with the first byte written to it by a PRINT command. It can contain any type of data and be structured in any way that the programmer requires.

#### EXECUTE:-

210-255 Same as for a code file except that the length is always 510 bytes and the memory address is the disc buffer address in the PLUS D (14848 (3A00hex)) or DISCIPLE (6656 (1A00hex)).

#### CREATE:- (Uni-Dos only)

210-255 Same as for a code file except the memory address is ignored on load and there can be no auto run address.

The file is structured as described in the UniDos create file manual.

#### SUBDIRECTORY:- (UniDos only)

210-212 Same as for opentype.

The file is always held on contiguous sectors. The last two bytes do not hold the next sector address. The structure is the same as the main directory with the exception that the last entry holds FFFF hex in the last two bytes and the first header entry holds the file header number of the parent directory.

Now aren't you glad you asked? Oh yes and before I forget Sam is different but it is explained in the MasterDos manual.

Any more simple problems? Then write to:-

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# MACHINE CODE WITHOUT THE TEARS

Part 6.

By:- Carol Brooksbank.

Last month, we looked at the way a letter shape is held in memory in the binary form of 8 numbers. But how are the correct bytes found when a letter is to be printed?

Spectrum and SAM have the same way of locating the 8 bytes for the pattern of any particular character. At address 23606 is a 2-byte system variable CHARS, which holds an address 256 below the start of the table of patterns. ASCII code 32 is the code for the first printable character. 8 x 32 = 256, so adding 8 x the ASCII code for a character to the address held in CHARS will always point to the start of that character's pattern bytes. There are 96 printable characters (ASCII 32-127 incl), and 8 x 96 = 768, the number of bytes in a font file.

The RST 16 (RST 10 hex) command we use to print characters to screen calls up a ROM routine which multiplies the ASCII code held in the A register by 8, adds it to the value in CHARS to find the character bytes, and then copies those 8 bytes into the screen file so that they appear one below the other on screen and print the character.

The Spectrum's character pattern bytes are in ROM, so if you wanted to use a fancy font for on-screen printing and listing, you would put the 768 font bytes somewhere in RAM to suit yourself and POKE CHARS to point to 256 below the start of your font. In machine code all we need to do is

```
LD HL, FONTSTART
DEC H
LD (CHARS), HL
```

because DEC H will reduce the number held in HL by 256.

The same approach will work with SAM, so long as your whole font resides below 32768 in memory, but there is also an even easier way. SAM's normal font is held in RAM, starting at 20880, so all you need do is load your font to 20880 and leave CHARS alone.

The fill patterns used in art programs like Artist II and Flash are also held in memory in files of bytes, with the pattern held in the set bits. Fig.1 shows a Flash/Artist II fill pattern, and the bytes which produce it. The fill is achieved by repeatedly

FILL PATTERNS, AS  
USED BY PROGRAMS  
LIKE ART STUDIO  
AND FLASH, ARE  
ALSO HELD IN  
MEMORY IN THE  
FORM OF LISTS OF  
BYTES, WHOSE BITS  
MAKE UP THE  
PATTERN.

FIG

FILL PATTERNS

11111111	255
10001000	136
10101010	170
10001000	136
11111111	255
10001000	136
10101010	170
10001000	136

Fig 1.



SPRITES, TOO, ARE HELD IN MEMORY AS LISTS OF NUMBERS, THEIR DESIGN BEING IN THE BIT PATTERN OF THE BINARY FORM

```

00000000 01110111 01000000 0 100 64
00000000 01111000 11100000 0 248 224
00000001 11110111 01100000 1 247 96
00000011 11100000 01100000 1 224 96
00000111 11000000 01000000 2 252 192
00000111 00000000 10000000 2 176 128
00001111 00000000 10000000 14 1 0
00001110 00000001 00000000 0 0 0

00011100 00000110 00000000 28 14 0
00010101 01110010 00000000 21 177 0
00010010 01000010 00000000 38 66 0
00001100 11100111 00000000 12 144 128
00000000 10011000 10000000 10 0 0
00000000 00000000 00000000 0 0 0
00000000 00000000 00000000 0 0 0
00000000 00000000 00000000 0 0 0

```

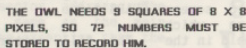


Fig 2.

Sprites, too, are no more and no less than lists of numbers.

Fig.2 shows a sprite which needs a block of screen 24 x 24 pixels to reproduce it, 3 bytes across by 24 bytes down. You can just about see the

So, let us write a program to print this owl on screen. We begin by storing the owl bytes. If you compare the program with the illustration, you will see that the bytes are listed in blocks, so as to correspond to those in the illustration, the top three listed first, then the

we have arranged the bytes needed for the owl as though they were the bytes for 9 characters in a typeface.

You must also check the symbol your assembler requires before the binary number. You may have to use % or some other symbol where I have used the @ symbol.

Now all we have to do is fool the computer into thinking the owl bytes are the first 9 characters in a font, and we can use RST 16 to print them.

```
PRBYTES  DEFB 32,33,34,13
          DEFB 35,36,37,13
          DEFB 38,39,40
```

You remember that the ASCII codes for a font start at 32, so we shall pretend that our owl bytes are ASCII codes 32-40. Between each row of 3 "characters" we shall need a CHR\$ 13 for a new line. So here we have the list of the bytes we want to print, in order.

CHARS EQU 23606

This is the system variable CHARS, which we shall need to poke to print our owl.

```
START LD A,2
      CALL 5633 (Spectrum)
      or
      CALL 274 (SAM)
      LD HL, (CHARS)
      PUSH HL
      LD HL, OWL
      DEC H
      LD (CHARS), HL
```



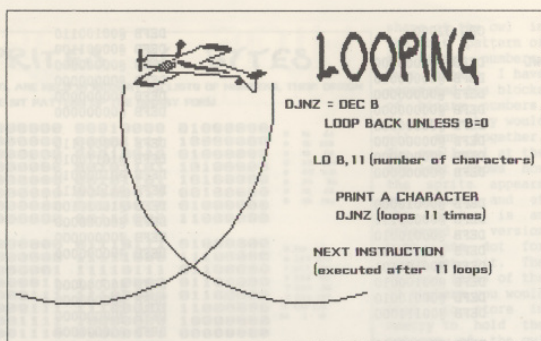


Fig 3.

The program begins by setting the printing to the main screen, which we have done lots of times now. Then, the address held in CHARS is saved by PUSH HL, because we shall need to put the typeface back in use before we return to BASIC. Then, the start of our owl bytes is loaded to HL. DEC H means that HL now holds OWL-256. When this is loaded into CHARS, the computer will assume that the owl bytes are the start of a typeface. When we load A with codes between 32 and 40 and use RST 16, the owl bytes will be printed just as though they were letters.

```
LD HL,PRBYTES
LD B,11
PRLOOP LD A,(HL)
RST 16
INC HL
DJNZ PRLOOP
POP HL
LD (CHARS),HL
RET
EQU S
END
LENGTH EQU END-OWL
```

The rest of the program is very simple, but we meet a new command. Up till now we have used JR and JP to repeat loops, with a marker byte to tell us we have finished. If you know how many times you need to repeat the loop, there is a much simpler way.

In this program we have 11 bytes to print, the ones listed at PRBYTES, so we load B with 11. At PRLOOP come the instructions for printing 1 byte and moving HL on to the address for the next one. At the end of these instructions comes DJNZ - Dec B and Jump if Not Zero - PRLOOP.

The program will loop back to PRLOOP 11 times, printing all our bytes, and then, because B is at 0 and the zero flag set, it will continue to the next instruction. For a graphic demonstration of this see Fig.3.

All we have to do then is POP HL to get back the original value of CHARS, restore it so that the typeface is back in use, and exit to BASIC.

When you have assembled the program and saved the object code, CLEAR 31999, load the code to 32000, and LET A=USR 32083 will print the owl to the screen.

Don't try to LD A,3 in the hope of printing the owl to the printer. The printer has its own built-in typeface and does not refer to CHARS, so all you would get on paper is a space followed by 8 assorted punctuation marks. We will think about printing the owl to the printer next month.



# THOUGHT SPOT.

By:- Jeremy Cook.

And now, ladies and gentlemen, the moment you've all been waiting for... (cue trumpet fanfare)... Thought Spot! Those who have been here before will know that we have a prize puzzle this month with ONE YEARS FREE SUBSCRIPTION TO FORMAT as the prize. Also there are several problems of a flummoxing nature for your perusal and (hopefully) enjoyment. I am still looking at the domino and hanoi puzzle entries, and details of at least one of these should be forthcoming next month.

Before you start, however, there is three errors in this sentence. What are they?

types (at least). They both use M=1000, D=500, C=100, L=50, X=10, V=5, I=1, and here is an example:-

1984 is MCMLXXXIV  
or MDCCCCLXXXIIII

I believe the first is modern and the second is ancient, but we do not know for certain which to use, so your program must recognise and work with both forms. Of course, your program will also be as short and neat as possible, and sent by 1st May 1992 to: Jeremy Cook (Thought Spot), 6 Burgoyne Road, Sunbury-on-Thames, Middx. TW16 7FW.

## PRIZE PUZZLE No.14: ROMAN NUMERALS

Once upon a future an electronic computer travelled back in time, and came screen to face with a Roman computer. Needless to say, they were both rather surprised. However, they overcame their shock and started to talk to each other. Fortunately both computers could speak fluent Latin, and so they got on quite well; at least until they tried talking about numbers. The trouble was that one thought in Roman numerals, and the other didn't. This was due to lack of thought on the designers part. So your task is to go back in time and act as interpreter. You can't? In that case write a program for the poor computer, then the designers in the future will come across the program and use it.

What must this program do, you are possibly wondering. Well, it must be able to convert (in both directions) between Roman numeral numbers and ordinary decimal Arabic numbers (numbers up to 4999 will do). Another point you may be wondering is what type of Roman numerals you should use, for to my knowledge there are two

## CROSSWORD

You may have noticed that one type of puzzle that has never appeared in these pages is the crossword. This has been deliberate on my part because I feel they are slightly inappropriate, and they appear everywhere else.

Having said that, I am a fan of crosswords so here is a small one for you. The only omission is the grid, about which I will just say that the pattern of squares looks the same if the grid is rotated 180 degrees. The clues are straight(ish) definitions.

- Across:- 1 Sailors' song. (6)  
4 Dwarf tree. (6)  
5 A secondary colour. (6)  
7 The best magazine!? (6)
- Down:- 1 A sign of the zodiac. (7)  
2 Donkey. (3)  
3 Set of three. (7)  
6 Animal of memory? (3)

## BOARD-DOM

Ask anybody how many squares there are on a chess board, and they will probably answer 64. But what about the



large 8x8 square (the whole board), the 7x7 squares, the 6x6 squares, etc? So how many squares are there? Then you can tell me how many rectangles there are on a chess board (squares are counted as rectangles). Lastly, if you have a disc with the diameter equal to one side of the board and you place the disc centrally on the board, how many squares does it completely cover?

#### REBUS / DINGBAT

Having bought a book called Dastardly Dingbats recently, I thought that I'd reproduce a few for you here. An example to get you going: "fabluece" means "blue in the face".

- |             |             |
|-------------|-------------|
| 1. EMOCELEW | 3. .BLANK   |
| 2. E E E    | 4. GIVE GET |
| R E         | GIVE GET    |
| R R         | GIVE GET    |
| G G         | GIVE GET    |
| A A         |             |

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**Hanky Quicky:** I counted 8 ways

**Ship Ahoy:** The ship is 2521 feet from Pauline and 2520 feet from Paul. The ship travels the 2500 feet to the jetty in 500 seconds.

**Travel Info:** Paris is 268 miles away. (a=42, b=43, c=44, etc.)

---oo00oo---

If you have any thoughts or contributions you would like to pass on then I would love to hear from you at the address given at the end of the prize puzzle section.

See you next month I hope.

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# FORMAT

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## YOUR LETTERS



Dear Editor,

My local computer club is a 16 bit computer club and I have arranged with them to let me set up my Sam Coupé and demonstrate what it can do (yes I have to pay). I work shifts and so can only go on two weeks in three.

The club meets on a Monday night 7.30 till 10p.m. I will be there on February 3rd, 17th, 24th. March 9th, 16th, 30th.

I don't think that I will get any converts from the ST or AMIGA users in the club, but it's a place to start.

Why I am writing this letter is to ask if you could put something in your letters page or in the small ads page to let Spectrum and SAM users know where they can come and see a SAM Coupé up and running, and use it. I have most utilities and games, and some hardware (SMBUS, SDI and mouse), plus lots of PD.

I have put up notices in all the places that will take them in Skelmersdale. That may bring in some of the local games playing children. With FORMAT's help, I may get some serious users to come and have a look.

What I am scared of is nobody turning up and I'm left on my own with all these 16 bit users looking at me in a funny way.

So its SAM Coupé Demonstration Evenings at the Ashurst Community Centre, Ashurst, Skelmersdale, Lancs, Just off the M58, Feb 3,17,24, Mar 9,16,30. Refreshments available. For more information phone Derek on (0695) 31163.

Yours sincerely, Derek Morgan.

I think you may be surprised Derek at the reaction from 16 bit owners, they may well be very jealous when they find out how cheap the SAM and it's software is. By the way, I can't understand why a computer club would charge someone for demoing their machine - I thought that was what

computer clubs were for!

Still I hope readers will support Derek. You never know SAM might take over the club given a little time. Ed.

Dear Editor,

Why do you keep printing such long letters?

Yours sincerely, Philip Gray.

If more people wrote short letters I would print them. Ed.

Dear Editor,

How come the SAM's PUBLIC section has been missing for several months. When it started you promised it was going to be a monthly look at the SAM Public Domain scene. Well it has been missing more often than it has been in - not what I would call monthly.

I get many of the disc mags and PD discs and I look forward to reading about new releases.

Yours sincerely, Dave Nestman.

I have to say that this is not the only letter I've had on the same subject. When I've made a promise in FORMAT it is one I intended to keep. However, I have to rely on our authors. Too often there are other commitments on their time - none of the writers in FORMAT make a living out of writing, they all have other jobs; university; school; etc to cope with. To look just at SAM's PUBLIC the answer is really one of Brent being overwhelmed by the success of the S.C.P.D.S.A.

Now let me turn the tables on you for a moment. If you are so "into" the PD software scene why don't you write something - I'm only too pleased to consider things from new writers. Ed.

Dear Editor,

Two articles for a future edition of FORMAT. First, re-inking fabric



ribbons. This method must be the cheapest and it works, it also means that the plastic case is not opened, therefore all the ribbon that is neatly folded stays that way.

The "tools" required are very simple: (a) plastic gloves (my supply comes from fuel station forecourts, they are supplied on a post in a container near the diesel pump, yes I have a diesel car) or you could buy them. (b) bottle of Quink Parker ink around £1.55 or black artist ink. (c) 40mm square by 15mm thick of soft flexible plastic foam (upholstery type) or other absorbent material. (d) old newspaper.

Place newspaper on the table, pour ink into lid and dip in foam or your material. Squeeze sponge to remove excess ink, on the exposed part of the ribbon simply apply the sponge and wipe on the outer edge. Ink will sink into the fibers. Wind on and repeat until finished. I marked my ribbon with a pencil so I knew I had come in a full circle.

ASCII. (a) Can I create a true ASCII text file on the Spectrum with save/load to PLUS D or any other 3.5" disc. (b) Could this file be loaded/saved on any other computer. (c) I have Tasword 2. I understand it cannot be used in standard form, what modifications would have to be done.

Could you please advise me on the above.

Yours sincerely, Kevin Gould.

First, I think you should read the articles John Wase wrote on re-inking ribbons. I would not recommend using normal ink as this will harm the print head.

Second, in TASWORD 2 just set the right margin one character in (so the line is 63 characters long). Provided you don't use printer control codes within the text the file saved will be ASCII. Ed.

Dear Editor,

Just thought I would write in to say thank you for a wonderful read, as well as to tell you and the other readers of a couple of undocumented features on the SAM Coupé version of

PRINCE OF PERSIA.

1. On the title screen, (where the music is playing) the 'I' key will run a short introduction program.

2. On level 3, the pile of bones will change into a human being on a 256K SAM, but stays a living skeleton on a 512K SAM. Neither can be killed, but both can be forced off the platform.

For those with 512K SAM who would prefer to fight a human being on the above point, hold down the SHIFT key when switching ON (or resetting) the SAM until the screen stops flashing. You should now be in 256K mode. Then load PRINCE OF PERSIA as normal. (It should take less time to load as well).

Furthermore, how to get a 102 columns display on the SAM. Simple, just load up FLASH!, select MODE 3 and then select SMALL FONT for the TEXT function. This should give you a 102 columns display. The only problem with this is that, for each new line, one has to press RETURN and then move the cursor down before starting again on a new line. I know this is a bit of a cheat, but one can save the MODE 3, 102 columns screen and load it back for one's own program later. (remember to select MODE 3 before loading the screen).

Again, thanks for FORMAT and may it last for ever and ever. I hope the above tips will come in handy for other readers of your great magazine.

Yours sincerely, Kim Shen Ang.

Dear Editor,

Re the functions of computer magazines, I suggest the direct (SAE) answering of technical queries, may be the most important of all. I am sure many of us might as a rule not mind paying a small fee, if necessary.

Actually I have no queries at the moment, apart from needing to know whether the +2A is fully compatible, if I change from this original 128/48K. Actually I find the original better at present, since it has all the scientific functions (used in my daily work) on the keys. Why the keys of the +2A have had to be "cleaned up", I don't know!

Am writing this letter via Tasword 128 with +D interface, and 3.5" disc. Even the humble 48K can do most maths things, including helicopter performance, and CAD of rotorcraft head etc., geometry.

Yours sincerely, J.S.Elliott.

For non urgent problems we have the Help Page where Nev will answer questions provided you give him sufficient information.

For more urgent matters there is the FORMAT hotline which is free to INDUG's full members.

To handle things by letter is very difficult, not everyone can explain their problem in such a way that the reader of the letter will understand both the nature of their problem and the solutions they have already tried. The response of FORMAT readers have proved - time and time again - that the hotline is a very valued service. Ed.

Dear Editor,

Many thanks for dealing promptly with my order for back issues of FORMAT.

I have noticed that FORMAT dealt initially for DISCIPLE and PLUS D users but has since included Spectrum and SAM users. Does this mean that you will be including more articles and programs specifically for the Plus 3?

I have been using the Plus 3 for the past three years and until now have accepted that I will have to continue using the 3" discs. However, since reading your magazine, I have been thinking of purchasing a second drive or changing to SAM. Unfortunately, the review of Outwrite in November's edition of FORMAT, including the problems with Tasword 2 and PCG's Wordmaster, has lead me to believe that I will be better off with a second drive as most of my work on the Plus 3 is with Tasword and Wordmaster both being compatible with my printer the Star LC 24-200.

If a second drive is the answer should it be the PLUS D at £129.99 plus carriage, or the Universal Lifetime drive supplied by EEC for £75 plus carriage? Would the latter

require an interface? I have not been able to find any advertisements for the Disciple and wonder whether these are still available. Your comments would be much appreciated.

Yours sincerely, Michael Atkins.

If you are looking to the future then SAM is the answer as nearly every 48k Spectrum program will run under one of the commercial emulators.

If you want to stay with the +3 then choosing between the two systems you mention is simple. If you want to use 128k mode then go for the EEC drive (what used to be the MGT Lifetime drive) which doesn't need an interface but does need extra software to format to large capacity. If however you are content with 48k programs (and most of the good software is 48k) then buy the PLUS D as it is a much more powerful disc system.

As to more +3 articles, I am looking for a +3 enthusiast to run a regular column - anyone interested? Ed.

Dear Editor,

If M.Perry (last months letters) has problems with sending faulty equipment back why does he not buy locally. If you support your local retailer he will support you. And if your local retailer doesn't stock what you want he will always order it for you.

Having said that I have a SAM, purchased just prior to the MGT collapse. And the only trouble I have had is a slight ghosting on the screen when using a monitor which I understand from past telephone conversations with you is quite common with SAM. Having said that, I did follow your advice and with careful adjustment the ghosting is only noticeable when there is a large bold shape on a plain background.

Long live SAM.

Yours sincerely, Kevin Bartlett.

Dear Editor,

I have just received the first issue of FORMAT for 1992, and having just read the letters page I felt I should write to you so I can put my feelings across to you about the letter by M.



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Perry who seems to be doing nothing but moaning and groaning about how much his SAM Coupé has cost him.

Well, I purchased my Sam when it first came out i.e. when it was MGT. and I paid £179 for a tape version, then I heard that MGT was calling in the receivers. But I still kept with the SAM and I added a disc drive for £80. Then I had to pay for a new ROM chip at £12 which we were promised would be sent free of charge.

I then got the 256K upgrade chip, so now I have a 512K SAM which has cost me around £300 to £350.

So, now you can get the same setup for £200 But I don't moan about it. O.K. maybe I thought it was unfair when they dropped the price, but I still use my SAM and I think it far better than many other computers on the market.

As you say a TV that cost £200 in 1990 you would probably get for £120 this year. But you wouldn't go into the shop and moan about it.

I think what I paid for my SAM was a fair price at the time when it came out. When you think the Amiga or the ST was then around £350. If you look in mags now the Amiga and ST have also come down in price, so what the hell is M. Perry moaning about.

As for SAMCO I have always found them very helpful. Anyhow I have almost had my say, except for one more thing. If M. Perry is so unsatisfied then sell the computer.

Sorry if this letter is long winded but I just had to write it after reading the letter from M. Perry.

Keep up the good work and all the best for 1992.

Yours sincerely, R. Clark.

Dear Editor,

A nice surprise this morning when my copy of FORMAT arrived so promptly, and here's to wishing you all a very happy and prosperous 1992.

One thing that particularly caught my eye was the letter from M. Perry with all his multitude of woes. Maybe he has had a bit of bad luck, but don't we all in these days of mass production.

I for my part may have been lucky,

but I doubt it. I did have trouble with the first Coupé sent to me about a year ago, and later with the built in disc drive. But a telephone call to Swansea on each account produced a replacement service unequaled by many suppliers these days, a completely new computer was dispatched by carrier within a week, and in the case of the disc drive, a new one was mailed by return of post.

You probably won't remember that I am out in the blue of North Devon and service can be hard to come by due to bad communications, but a lot can be accomplished by telephone and a sympathetic approach on both sides to the problem at issue, and this I certainly found was the case with those at SAMCO.

I have no way of getting to the All Format shows and have to depend on info gleaned from FORMAT or by telephoning potential suppliers, so perhaps Mr Perry doesn't appreciate how fortunate he was, even to sample them and thus decide whether he could gain anything or not. As for getting repairs done locally, there is just no such facility available.

As for cuts in prices, how often I wonder does it not happen that such cuts come about as soon as one has purchased something, be it almost anything from a kitchen utensil to a motor car. It's something that cuts do come about for whatever reason in this day and age.

Yours sincerely, Basil Lankester.

Mr Perry's letter has caused an avalanche of mail on the subject. Over 80% have been like the three above.

We all know every company produces the odd 'rogue' machine but in general SAMCO are not doing too bad. If you want Rolls Royce construction, performance and service, then you must expect to pay Rolls Royce prices. If I had a pound for every time someone had told me the service given by someone was not like it used to be I would have been able to retire to the South of France years ago. It is a fact of life that the consumer electronics is

Turn to page 36.



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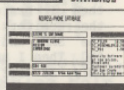
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# Z80-SUBS

## MACHINE CODE SUBROUTINES.

By:- Bill Nicholls.

Hello, good evening, and welcome, time for a few subroutines again. Hope you missed me last month.

I have not received much input from readers yet. I sincerely hope this is because of your reluctance to entrust items of such value to the Christmas post. Please, send me something soon, I need you to support this column.

Having said I haven't had much from readers, I have had one letter via the FORMAT office. This came from Francis Miles, who many of you will remember as the author of the excellent series of articles "Inside Word Manager" which appeared in FORMAT some time ago.

He comments that one of the routines he most uses is called "P.SCR" which I'll list here:-

```
P.SCR LD A,2      ;select stream 2
      CALL 5633   ;open chan routine
P.MES POP HL      ;HL points to byte after call
      LD A,(HL)   ;get the byte
      RES 7,A     ;scrub hi bit for now
      RST 16      ;print the character
      BIT 7,(HL)  ;check for end of message
      INC HL      ;point to next byte
      PUSH HL     ;stack HL
      JR 2,P.MES  ;loop till end of message
      RET         ;return to byte after message
```

The routine is used in the following way.

```
CALL P.SCR
DEFP 'Hello! This is your computer speaking'
DEFB '!' ;128
      rest of program here....
```

What the routine P.SCR does is to POP the return address off the stack. Remember that the return address is the address of the byte after the CALL instruction. It then loops through the routine reading characters until it comes to one with the high bit set (+

128 in other words). As it keeps INCrementing HL and PUSHing it onto the stack again, when the RET instruction is obeyed the address of the byte after the message is the one that is RETURNed to.

Two Spectrum ROM routines are used. CALL 5633 (or 1601 hex) opens a channel, in this case to stream 2 - the main screen. The other one, RST 16 calls the ROM routine that prints a character to the selected stream, which could just as easily have been sent to the printer (stream 3) or anywhere else for that matter.

Francis also points out that you can send screen control codes as part of the message i.e.

```
13 - newline
6 - PRINT comma
16,n - INK colour n
17,n - PAPER colour n
18,0/1 - FLASH off/on
19,0/1 - BRIGHT off/on
20,0/1 - INVERSE off/on
21,0/1 - OVER off/on
22,x,y - PRINT AT x,y
23,x,0 - PRINT TAB x
```

The subroutine will not print tokens, UDGs etc, because it always zeroes the hi bit of the character code before printing, although it would be quite easy to modify so token would print (let me see your efforts please).

Francis also mentions that he has a routine for HL=HL+DE. He points out that this can be done by the floating-point calculator in ROM but that it is pretty slow. He would be interested to see if any other reader has worked that one out (and so am I) so come on you lot, send your routines in.

Next, a little routine which will



produce some interesting results with screen displays. As you know the Spectrum screen (and I'm told a SAM mode 1 screen) is stored as a block of 6144 bytes which hold the pixel information followed by 768 bytes which hold the colour attributes.

This routine assumes you have two screens, one in the normal position (at 16384) and one stored at another place in memory (in this case 49152).

```
SCRNORG LD HL,16384 ;point to main screen
LD DE,49152 ;point to 2nd screen
LD BC,6144 ;number of bytes
NEXT LD A,(HL) ;load byte from main screen
OR (DE) ;OR it with byte of 2nd screen
LD (HL),A ;and put it back
INC HL ;up first pointer
INC DE ;and second pointer
DEC BC ;down counter
LD A,C ;now test counter
OR B ;to see if we are at the end
RET Z ;if so return
JR NEXT ;else loop to deal with next byte
```

What the routine does is to merge two screens using the OR instruction. The screens attributes are ignored in the sense that the original attributes of the main screen are not altered in any way.

Right, type it into your assembler and try it out with a couple of screens. Good ain't it my friend? Well next try using the XOR or the AND instruction instead of OR. Play with the routine, that is half the fun of computing.

I'm again sorry to say there is no more room this month, but I will see you again next month all being well.

U.W.M.A.

Any contributions to Z80-SUBS should be sent to :-

Bill Nicholls,  
Format Publications,  
34, Bourton Road,  
Gloucester,  
GL4 0LE.

YOUR LETTERS - Continued from page 33.

a fast moving industry where pricing is very cut-throat. As such there simply are not the margins for any company to provide the sort of service Mr Perry seems to expect.

As to the accusation made in one letter that I had a vested interest in SAMCO I can state that that is just not so. I lost personal money when MGT failed, I have no investment in SAMCO nor do I receive aid and form of financial aid from them. In fact, it is quite the reverse, the technical support I give to SAMCO and it's customers costs me far more than I ever make out of SAMCO. I support the machine, not because it is perfect (I am realistic) but because I feel it is the best value for money machine on the market today.

And one final word on the subject. If readers have problems and can't sort them out then phone the FORMAT hotline - I will try to help as much as I can. But please, don't bombard companies with letters like Mr Perry does, if you use the phone you can normally get things sorted out far faster. Ed.

\* - \* - \* - \*  
Letters may be shortened or edited to fit on these pages.

This is YOUR letters page so it is up to you, our readers, to fill it. Send your letters, on any subject you feel would interest other readers, to our usual address, keep them as short as you can so we can fit in as many as possible.



'Every year it gets more difficult trying to think of new names'

# POKE - MEM\$

By:- A.F.Olivera.

Issues 2 and 3 of the SAM Coupé ROM did much to remedy the difficulties encountered by early owners of SAMs who received their machines with the bug-ridden ROM 1. However, that is not to say that these later ROMs are free from problems, although most are of little consequence. This article describes a problem that exists with the MEM\$ command and suggests a way round it which, at the same time, improves the performance of the command concerned.

The problem comes to light in certain circumstances when a direct POKE with MEM\$ is executed. The following program illustrates the problem (the REMs should assist in understanding what the program is doing):

```
5 REM listing 1
10 REM "POKE...MEM$" TEST: A.F.Oliv
   rem 15.3.91
20 CLEAR 32768: LET a$="0123456789A
   BCDEF": POKE 32768,STRINGS(20,a$
   )+STRINGS(20,a$): REM a sequence
   of a's is poked into memory
30 PRINT MEM$(32768 TO 33375): REM
   print a screenful of the sequenc
   e
40 PRINT #0;"HIT ANY KEY": PAUSE :
   CLS
50 POKE 32768+132,MEM$(32768 TO 333
   75): REM copy the sequence to a
   location 132 bytes higher up in
   memory, using POKE...MEM$ direct
   ly
60 PRINT MEM$(32768+132 TO 33375+13
   2): REM print the sequence at it
   s new location - it is now corru
   pted!
```

To be precise, the problem only occurs if the new section of memory overlaps the current section; and this is due to the copying routines processing data 256 bytes at a time. When one copying phase overwrites data

which has still to be copied by a subsequent phase you don't get what you may have expected. Thus, for example, a 500 byte section of memory can be POKEd directly using the MEM\$ function with perfect results so long as it is POKEd into an address below the source address or more than 500 bytes above the source address. If destination is greater than source but still overlaps then the results will be simpler to that shown by the above listing.

Fortunately, there is a way of avoiding the restriction. In the above program, replace line 50 by the following line:

```
50 LET memory$=MEM$(32768 TO 33375)
   : POKE 32768+132,memory$: REM co
   py the sequence to a string vari
   able, then POKE the string into
   a memory location 132 bytes high
   er up in memory.
```

Run the program again, and you will see that this time the data is copied perfectly, without corruption. The answer then would seem to lie in assigning the section of memory to a string variable, and then POKEing the variable to the destination address. This is quite practical so long as the section of memory concerned is reasonably small; if, however, it is large, this could well result in an "Out of memory" message, since the string variable has to assume the same length as the section of memory involved.

To avoid this happening we have to keep the string variable to a reasonable length, which means copying the memory section in fragments; say, 3000 bytes at a time. In such circumstances, also, we have to be careful not to commit the same mistake as the ROM routines of overwriting



data not yet copied, and accordingly the order of copying must commence from the end of the memory section if we are copying into higher memory, and from the start if we are copying to lower memory.

A program which satisfactorily does this is listed below as a DEFINED PROCEDURE called "copymem".

```
7990 REM listing 2 :
7995 REM a f olivera 15.3.91:
8000 DEF PROC copymem start,end,newst
    art: REM a procedure to copy a
    section of memory to another add
    ress, avoiding mem$ problem
8005 LOCAL diff,addr1,addr2,memorys
8010 LET diff=newstart-start,addr1=st
    art,addr2=end
8015 DO : IF diff>0 THEN : LET addr1=
    addr2-3000: ELSE : LET addr2=addr
    r1+3000
8020 IF addr1<start THEN : LET addr1=
    start
8025 IF addr2>end THEN : LET addr2=en
    d
8030 LET memorys=MEM$(addr1 TO addr2)
8040 POKE addr1+diff,memorys
8050 IF diff>0: LET addr2=addr1-1
8060 LOOP UNTIL addr1=start: ELSE : L
    ET addr1=addr2+1: LOOP UNTIL add
    r2=end: END IF
8070 END PROC
```

It has to be MERGED into your program and called with the parameters defining the addresses of the start and end of the section of memory being copied, and the address to which it is being copied. For example, to copy the section of memory between 50000 and 65000 so that it will instead occupy the memory locations stretching from 50200, you would have to enter:-

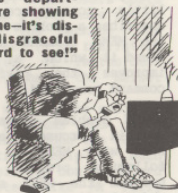
copymem 50000,65000,50200

"Copymem" can handle any length of memory, in contrast to MEM\$ which is limited to 65535 bytes. On the other hand, it is about 4 times slower than the POKE...MEMS combination. In practical terms it means that it will copy 64k in about 2.7 seconds, compared to the 0.7 seconds taken by POKE...MEMS. A chunk of memory 300k long (which cannot be handled by a

simple POKE...MEMS instruction anyway) takes about 12 seconds to copy. These timings apply when processing is carried out in 3000-byte fragments; shorter times can be achieved if the two "3000"s in line 8015 are changed to a higher number (up to 65534), but at the expense of perhaps having to raise RAMTOP to have enough memory available for the program to work.

I hope readers will find this routine useful.

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