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FORMAT

THE HOME OF Z80 COMPUTING



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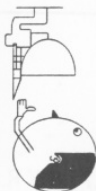
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NEWS ON 4

AMSTRAD STILL FACES TROUBLE

Even after its break-up, Alan Sugar's Amstrad group faced pressure on two fronts this month. Hard drive company Seagate said it will appeal against a High Court award of £86 million in damages to Amstrad. Meanwhile, Amstrad spin-off Viglen floated on the London Stock Exchange with its share price starting at 64.5 pence, giving it an overall market valuation of around £80 million, less than expected by most City analysts.

Alan Sugar, chairman of Amstrad, has a 20 per cent stake in Viglen, diluted from 34 per cent after investment bank Deutsche Morgan Grenfell advised him that such a large shareholding could adversely affect the flotation.

Shareholders in Amstrad, which was dissolved at the beginning of August, have already received 163 pence a share in cash and options in Viglen and Betacom stock. Those shareholders have also been given so called 'litigation certificates' based on money won in recent legal battles against both Western Digital and Seagate, in which Amstrad alleged its business had suffered because it had been supplied with faulty drives.

With the demise of Amstrad it is unclear what has happened to the legal rights to both the Spectrum and CPC range of computers.

COSTS DISCOURAGE UK USERS

The Internet remains the domain of the well-off and technically competent claims a new report.

The survey of 2,000 UK households, sponsored by BT and conducted by market research organization Durlacher,

found that while most people know about the Internet, only 17% of households had ever used it. Of those, the majority were in higher income brackets and living in higher-income regions.

According to the report, the major barriers to wider use were: price of equipment, price of access and speed. Computers powerful enough to surf the World Wide Web are very expensive as is the cost of telephone access in the UK. "The deployment of digital transmission technology across terrestrial, satellite and cable should create a number of new opportunities to repackage and re-price Internet access and will be a crucial step to broadening the marketplace," said Nick Gibson, Internet analyst at Durlacher.

However, the report claims that the potential for electronic commerce looks high, with half of those households with Internet access at home or work willing to buy goods and services on-line. Books, CDs, holidays, and software were the most popular products for this method of purchasing.

GLOUCESTER SHOW

Remember that the Gloucester show is just round the corner again - the 25th October will soon be here.

YOUR NEWS HERE...

Come on readers, we need your news. Anything related to computers which you think will interest other SAM and Spectrum owners. Just jot it down on a piece of paper, add your name and membership number, and send it off to us at the usual address. Please mark the envelope 'News' so that we can give it the priority it deserves.

Remember, you get three months extra subscription for every news item we print, so don't rely on others to send in an item you have seen - send it off yourself and earn our thanks as well.



She's back - hip hip hooray. Yes, Jenny has had her annual summer two weeks away from me and as usual I'm in trouble because I did not do enough work while she was away. Well I ask you, how can you work properly without the whip cracking several times a day?

Still, she chose both the hottest week and the wettest week of August. Lucky for her they were two different weeks. And it is still hot this week, working in the office is like working in a sauna but we have to keep going in order to get this issue out to you - the things we do for our readers....

Right. First real thing this month is the Northern Sam & Spectrum Show. Just two days after the last issue went to bed, complete with my comments that there was not going to be another NSSS, I had an email to say that there was going to be a third one after all. Alan Clarkson is away (overseas I think) so George Boyle is organizing things instead. The show will be at the usual venue in Wetherby, Yorkshire. Sadly due to the very short notice on this one, and its close proximity to the Gloucester show on the 25th October, **FORMAT** will not be able to attend. Hopefully we will be able to work out something for the next one.

Next, subscription rates. As you may remember I said some time ago that we would be forced to raise them but that we would put it off as long as we could. When **FORMAT** PC was started last year it seemed like a good idea to kick things

off on the new rates from the start, but I have held back on raising prices for Spectrum and SAM users for as long as I can. So, with immediate effect, the new subscription rates are going to be as follows:-

UK (incl. Channel Isle etc) £20
Overseas Surface Mail £30
Overseas Airmail £40

These rates apply right away for new members. However, current members will be able to claim a special 25% discount on renewals until the end of 1998. In addition, any renewals received before the end of '97 will be accepted at the old rates (UK £12, Surface £16 and £25 Airmail).

This is only the second time we have raised prices in 10 years - not a bad record I think you will agree. In that time we have seen printing prices rise by over 300%, the cost of envelopes has gone up by 235%, we have seen postage rise by 60% (even higher for overseas), and as for Jenny's wages - well....

Well, this is the last issue of volume 10, the next issue will be the first of a new volume and the start of yet another year for **FORMAT** and **INDUG**, one which I hope will continue to see us set the standards for others to aspire to. Thank you all for reading, thanks to those that have written or contributed to **FORMAT** in some way, however small. Without you we would be out of a job.

Until next month.

Bob Brenchley, Editor.

SAM elite 512

The advanced computer that retains a user friendly appeal which makes even the beginner feel right at home. An easy to learn basic and disc operating system (no messing with slow tapes here) will allow you to do things you never thought possible before. Your SAM comes with a very easy to read manual and everything you need to get started - it even has some pretty impressive demo software for you to run, just to give you a few ideas for starters.

If you already own a Spectrum then this is the machine for you because you don't have to throw away all you have learnt so far - just be prepared to be amazed at the extra power and features.

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We are able to supply a small number of professionally reconditioned SAM Coupé computers. These have been fitted with a modern style disc drive, a version 3 ROM, new keyboard unit, and are supplied with new manuals and DOS system disc. They carry a full 90 day full return to base warranty. Because these are reconditioned machines there may be slight blemishes to case or base.

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In most cases we find the faults with old drives are mechanical (due to worn heads, stepper motor failure, etc.) In these cases you need an internal interface Type 1 to which you transfer the 1772 disc controller chip from your old drive - thus making the upgrade as cheap as possible.

If you want to fit a second drive (or first drive, if you don't have one or the 1772 on your old drive is faulty) then order a Type 2.

Both types are available in either kit form or ready assembled. For the kit you will need screwdriver, soldering iron, solder and a reasonable level of soldering skills. All you need for the assembled version is a screwdriver. Full fitting instructions are given and the only other thing you need is a standard PC type disc drive from your local supplier (cost about £20 to £25).

If you have any doubts about which type of interface you need or any questions about the drive fitting in general, then please give the FORMAT hotline a ring on 01452-412572 and they will be pleased to help you.

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INTERFACES

These interfaces work with both the SAM elite and the SAM Coupé unless otherwise stated.

SAM MOUSE SYSTEM Interface. High Quality Mouse and the software to drive it. The interface plugs into the mouse port on the back of SAM so you don't need a spare expansion socket. More and more software now works better if you use a mouse. **Only £39.95**

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SHORT SPOT

YOUR HINTS, TIPS AND PROGRAMMING IDEAS

Edited By:- John Wase.

You know, it's amazing how quickly Short Spot time comes round! I thought that as I'm now beginning to wind down (did you know I was taking early retirement) and with a wife to do all the work, I'd have more time. Not a bit of it! Once again, Bob's bawling for his copy and it's ninety in the shade (and Bob's having to spend the afternoon in a cold bath) and I'm just not ready. Damn! Honeymoons are much more fun! (Just be careful what you're saying; this is a family magazine - Lorri).

Before I start things properly, I just thought I must mention again a big thank you to all of you (particularly Bjorn Nyberg) for your good wishes you have sent to us. Lorri and I (please note that that's how she spells it) are overwhelmed by everything and everybody. Thank you!

So let's start off with an interesting little problem. Colour Weaver. Again. This time, it's a technical 'itch' I'd got a modified, generally altered SAM-compatible Colour Weaver disc with some interesting bits on. Just the thing for the next Short Spot, I thought. However, if you remember, funny things happened to SAM when I got a disc done on the PLUS D and read it on SAM; it managed to translate a Spectrum program, albeit with weird keywords that didn't make sense. Anyway, there was no problem saving this one this time, so I sent it off to Bob. It's a full Spectrum program that lists and does everything it ought to do. Now, technically, things get tricky. I think

Bob's already explained to you that programs for the Spectrum get converted to a SAM (using the translator program by Dr Andy Wright that is on the SAMDOS system disc), then all these converted programs are collected together, along with those programs originally written for SAM and any oddments like Z88 jobbies, and the lot gets converted to IBM PC-compatible format (using SD Softwares PC Suite package), ready to go into the magazine.

I use Ami-Pro, (or whatever they call it now) to write my text in (the only time I use it, so it's specially for that), and the converted programs listings get added to the text by Bob and the lot goes into **FORMAT**. So we did things as usual and among the stuff which went to Gloucester was this Colour Weaver Spectrum job, along with the usual collection of programs and IBM PC-text.

All went well until Bob tried to convert this. It got as far as the SAM and then jammed. There's something on the end of the file stopping it going any farther; something that's been put in or something that disagrees with the conversion program; it's reproducible and does it every time! We've given up and sent it off to Nev! We'll try and let you know what's happening - B U T... I suspect that the problem lies with all our geriatric PLUS D's.

Matthew Westcott of Chorley writes with a snippet and a problem. It's a program he's written to fix the problem of the PLUS D interfering with the Kempston joystick port. Normally, this

isn't a problem, because most games have control selection menus, but a few try to be clever by testing everything at once during the game, resulting in unwanted movement.

Matthew therefore wrote this snippet: a two-liner; a real short spot! It creates an execute file: when you run it, it scans through the memory looking for the code which reads the joystick movement and 'patches' it to disable the joystick altogether.

```
5 REM PLUS D Joystick patch M
  atthew Westcott August 1997
10 CLEAR 39999: FOR a=40000 TO
  40023: READ p: POKE a,p: N
  EXT a: SAVE d**KEMPSAN*X,4
  0000
20 DATA 33,0,64,1,0,192,62,219
  ,237, 177,192,62,31,190,32,
  246,43,54,62,35,54, 255,24,
  238
```

To use it, the execute file should be loaded after the game has been loaded, but before running the game. Trouble is; that's easier said than done with protected commercial games! For this reason, this program would be infinitely more useful if it could be incorporated into a snapshot function, rather like Miles Kinloch's 'Snap Out' program in volume 9, N°7, but despite having examined this in detail, poor Matthew can't get anything similar to work, mainly due to a lack of knowledge of the PLUS D's inner workings! Many thanks, Matthew. Now, can any of our readers help poor Matthew? Please!

Next, I have an item from Kevin Cross of Plymstock, Plymouth. Kevin is BRILL! Yes, folks; he's done what I've been looking for for about the last fifteen years. Do you remember a couple of months ago a plea from me, mentioning that I could convert files from the Z88 to the Spectrum. And wouldn't it be useful if it went the other way, so that you

could get a file from any computer, stuff it into the Z88, carry it around under your arm and then get it to disgorge into any other computer. So that in effect, you've a travelling hard disc which would transfer any files between anything. Well, here's a pretty good start!

Kevin writes that he wrote an article some time ago, intending it for **FORMAT**. Somewhere it got lost, was never published, and I've at last got hold of it, so it forms the basis of some of these notes. I don't want to publish it all this month, or those of you without these marvellous machines (shame) will be bored to tears, so you'll have to have bits, as it were: programs on the instalment plan, like Emmerdale.

It all started with Bill Richardson offering new Z88's in November 1994. Kevin didn't know what they did, and was unwilling to spend all that money, but intrigued enough to buy 'Z88 computing' by Ian Sinclair. The Z88 was reviewed by Anthony Drage (**FORMAT**, February 1995), and Kevin's interest increased. A few weeks later, and there it was, spotted on the shelf of a local second hand (junk) shop; Z88, boxed, instructions, 128K RAM, PC link and power adaptor: £55.00.

Got some batteries; went back. How do you turn it on; there's no power switch! Quick look at the instructions, and we were away! Chatted up the bloke in the shop (who had no idea)! "What'll you take for it?" "Forty-five pounds". "Sold; thanks very much!" Thus began many hours of enjoyment for Kevin, and the beginning of computer-widowhood for Jane (Sorry, Jane; I do love you!)

Kevin soon wondered if he could transfer text to a disc and then to Tasword 128 on his PLUS D-equipped Spectrum, and then back again if needed? Could a file be backed up to disc, and then sent back again?

Well, in the end, Kevin achieved all this and more. This is an account of how he did it. You may be able to do better. If so, share your knowledge; let us all know about it. These programs were a matter of trial and error, and are rather slow. To transfer 14000 characters of text from disc to Z88 took around 19 minutes, so it's best to have something else to do while you are waiting. They work, but can be improved upon. Suggestions welcome; I leave that to you. Good luck!

This is your shopping list. First; you need a telephone-type plug for the RS232 port, or as Kevin did in desperation - use the plug and lead from a light gun. Note that the telephone plugs Kevin bought to start with were only 4-way, though from the outside they look just like 6-way. When at last you have managed to get a genuine 6-way plug, you will need to modify it to make it fit the Spectrum socket. You'll also want a length of connecting cable with at least 5 wires, preferably colour coded, to suit the plug. A 9-way D (male) plug to connect to the Z88, and this one is likely to be a problem, as when the shell is attached to the plug, it may not plug into the Z88. Either shop around for one that will, or do as Kevin did and attack it with a modelling knife, and when all is working, seal it up with some epoxy glue.

It also took some time to work out how to wire the plug up correctly. The Z88 wiring connections show TxD->, RxD<- and so on, showing the direction of flow, but the Spectrum manual merely labels the connections:-

- 1 GND
- 2 TXD
- 3 RXD
- 4 DTR
- 5 CTS
- 6 +12V (When wiring, connect *nothing*!)

Kevin, being a rational being, assumed

that TxD would be out; RxD in. Wrong; it's the other way round - TxD in, etc. Anyway, wire as follows:

SPECTRUM		Z88
Pin 1	to	Pin 7
Pin 2	to	Pin 2
Pin 3	to	Pins 3 & 8
Pin 4	to	Pin 4
Pin 5	to	Pin 5
Pin 6	No connection	All other pins: no connection

Ensure you make no connection to pin 6 on the Spectrum or pin 9 on the Z88, as both of these carry voltages, so be careful of strands of solder. Done that already? Good! You will now need to configure a system disc to use the Spectrum's built-in RS232 port. So drag out your tape and a new, formatted disc, and when prompted if you are using the PLUS D's centronic printer-port, answer 'no'. Turn off the Spectrum, and boot up, using the new system disc.

On the Z88, set the transmit and receive baud rates to 9600, the parity to 'none', and Xon/Xoff to 'no'. Now connect the two computers together with your new lead, type in this program, and run it to see if they will introduce themselves.

```
10 DIM m(22)
20 FOR n=1 TO 22
30 READ m(n)
40 NEXT n
50 PRINT AT 1,0;"Hello this is
  your Spectrum enter th
  e terminal program on you
  r Z88 and type a small
  message introducing theZ88 t
  o me Terminate by
  pressing (ENTER) onZ88."
60 FORMAT "p";9600: OPEN #4;"p
  ": REM OPEN RS232 PORT & SE
  T BAUD RATE
70 LET a$=INKEY$ #4
80 PRINT :a$;
90 IF CODE a$=13 THEN GOTO 110
```

```

100 GOTO 70
110 FOR n=1 TO 22
120 LPRINT CHR$(m(n));
130 NEXT n
140 STOP
150 SAVE d1"DEMO" LINE 10
1000 DATA 72,105,32,73,32,97,109
,32,97,32,83,112,101,99,116
,114,117,109,32,49,50,56

```

All being well, the message you typed on your Z88 should have appeared on your television screen as you did so, and on pressing [ENTER], a message from your Spectrum should have appeared on the Z88 display. If nothing happened, check you are using the correct boot-up disc and all connections on your lead.

Next month, we'll take Pipedream files and pass them to opentype files for use on the Spectrum. For now; many thanks, Kevin.

Next, a note from the evergreen Roy Burford, of Norton, Stourbridge, West Midlands, who sends in a clutch of Spectrum programs. The first item from Roy is RANDOMIZEn; the listing gives the origin and details. It demonstrates that the RANDOMIZEn and RND features on the ZX Spectrum are similar to the ZX81's RANDN and RND. When n=0 or absent, RND values start at a point in the series determined by the time elapsed since power-up. When n is positive (1 to 65535), the START point is determined by this value. Whilst Roy has not, before, used this facility in this way, he mentions that it can be useful for testing programs using RND when one wishes the value of RND to be repeated. Try using a value of n a few times and the list of random values printed to the screen should make the action clear.

```

1 REM M.James & S.M.Gee. The
  Art of Programming the 1K Z
  X81. Bernard Babani(Publish
  ing) Ltd. p6. RND and RAND.
2 REM Adapted to test on ZX S
  pectrum+ 128K by B.C.R.Burf

```

```

ord 310497.
10 INPUT "Number(-1 to exit)?
  ";n
12 IF n<0 THEN STOP
15 CLS
20 RANDOMIZE n
30 FOR x=0 TO 14: PRINT RND: N
  EXT x
40 GOTO 10

```

There, that's a straightforward bit of typing, isn't it. Now, after you've played with it a while, what can we use it for?

One such application is in the form of CODER on the disc. Again, the origin is in the REMs. For example, Roy writes that on his Spectrum+ 128K in 128 Basic, and using as an example: Key Number = 5; Encode(1); Message = John Wase; comes out as

JAVZcuft

Which doesn't look like my name at all. Cool, eh? Now try decoding it, and you should get me back! Well; we hope so!

What? Oh, the listing? Here it is: type it in and try it!

```

1 REM M.James & S.M.Gee. The
  Art of Programming the 1K Z
  X81. Bernard Babani(Publish
  ing) Ltd. 1983. p74. Codes
  and cyphers.
2 REM Converted to ZX Spectru
  m+ 128K by B.C.R.Burford 02
  0597.
10 PRINT "      Coder"
20 PRINT "Key number(>0)? ";
30 INPUT k: PRINT k
40 RANDOMIZE k
50 PRINT "Decode(0) or Encode
  (1)? ";
60 INPUT d: PRINT d
70 IF d=0 THEN LET d=-1
80 PRINT "Type your message:"
90 INPUT a$: PRINT 'a$
95 PRINT
97 IF a$="" THEN PRINT "No mes
  sage!": STOP
100 FOR i=1 TO LEN a$
110 LET a=CODE a$(i)-32
130 LET a=a+d*INT (RND*95)
135 LET a=ABS (a-INT (a/94)*94)

```

```

140 IF a>94 THEN LET a=a-94
160 PRINT CHR$(a+32);
170 NEXT i
180 STOP

```

Finally, Roy sends a little educational program for our edification. It's called 'Starcount', and it's nice. Type it in and see....

```

1 REM Program on ZX81 16K sto
  rage tape.
2 REM Now on ZX Spectrum+ 128
  K by B.C.R.Burford 170497.
10 PRINT "      Counting"
15 PRINT "Can you count to 10
  ?"
20 PRINT "'A star looks like
  this:- '"
25 PRINT "Any key to cont
  inue:"
30 LET k$=INKEY$: IF k$="" THE
  N GOTO 30
40 LET score=0
65 FOR g=1 TO 10: CLS
70 PRINT "How many stars on t
  his row?"
90 LET stars=INT (RND*11)
100 PRINT
110 GOSUB 320
140 INPUT answer
145 PRINT "      ";answer
150 IF answer=stars THEN GOTO 1
  58
152 GOSUB 230
153 GOTO 160
155 GOSUB 230
158 GOSUB 200
160 FOR d=0 TO 100: NEXT d
170 NEXT g
180 PRINT "You scored: ";score
  "; out of ";g-1
186 PRINT "Another one? Y/N:";
187 INPUT q$: PRINT q$
190 IF q$="y" OR q$="Y" THEN GO
  TO 40
195 STOP
200 PRINT
205 PRINT "Correct, there are "
  ";stars;" stars."
210 LET score=score+1
220 RETURN
230 PRINT
232 PRINT "No, there are ";star
  s;" stars, look.."

```

```

235 PRINT
250 GOSUB 320
270 IF stars=0 THEN GOTO 310
275 FOR n=1 TO stars
280 PRINT TAB (n*2);n;
285 FOR d=0 TO 19: NEXT d
300 NEXT n
305 PRINT
310 RETURN
320 IF stars=0 THEN RETURN
325 FOR n=1 TO stars
340 PRINT TAB (n*2);***;
343 FOR d=0 TO 49: NEXT d
350 NEXT n: RETURN

```

And that's all for this month from Roy. We get lots of letters telling us how wonderful *SHORT SPOT* is. Well, it is, isn't it. But it wouldn't be nearly as wonderful without the regular stream of bits and pieces from Roy: we're really very, very grateful to you, and many thanks.

Next, one or two other bits and pieces. Like that from Cliff Jackson about SAM. Cliff, of Southampton, writes that he is sure that I have been inundated by a deluge of letters pointing out that POKE 23658,8 sets both the Spectrum and SAM to upper case. Poking zero to the same address restores lower case, also for both machines. While Spectrum books tend to refer vaguely to that address as 'Flags2 - more flags', the SAM technical manual is more specific on page 75, where KLFLG (also at 23658 to preserve compatibility with the Spectrum) says '8 if caps lock on, else zero'.

The position with UDGs on SAM is less clear to Cliff, since, like me, he suffers from prolonged and severe bouts of senile amnesia. The User Guide says on p89 'CHR\$ 144 to CHR\$ 168 are also foreign character UDGs...'. But without giving any addresses. The technical manual on page 27 says that Chars start at 20880, Character patterns CHR\$ (32-127) start at 21648, while those for CHR\$ (127-168) start at 21976. Cliff

struggled with this problem several years ago, and made a little pencilled note in the margin of page 89 of the User Manual to the effect that UDG 'A'=21776 (CHR\$ 169), but is now no longer sure of the accuracy of this remark.

Of more practical use may be the lines of Basic which he used at about the same time to create two UDGs which produce representations of the up and down arrows to form part of an input prompt.

```
910 RESORE 940
920 FOR n=0 TO 7
930 READ m
940 DATA 24,60,90,153,24,24,24,24
950 POKE (21776+n),m
960 NEXT n
970 RESTORE 1000
980 FOR n=0 TO 7
990 READ m
1000 DATA 24,24,24,24,153,90,60,24
1010 POKE (21784+n),m
1020 NEXT n
```

Those lines create the UDGs which are produced when required by PRINT CHR\$ 144 and PRINT CHR\$ 145, writes Cliff, who hopes this is of some use to readers with the conversion problems.

Many thanks, Cliff.

A short note also, from Bob Whittle of Rainhill, Prescot, Merseyside, who thanks me for printing his electric bill Spectrum program (thanks for sending it in, Bob; without programs, we'd have nothing to print), and also thanks Roy Burford for his 'user-friendly' modifications. Bob has had another look at it, and by a simple adjustment, makes it still nicer, as you can now type in the pence as they are on the bill!

Merely delete line 15 from the original program, and revise lines 140 and 230 to:

```
140 LET am=us*ppu/100
230 LET chg=sc/100*nod
```

and there we are! Many thanks, Bob.

A little snippet from Belfast which John Adams has been waiting patiently to see now follows. He has collected this piece from 'Input' 1994, it's for the Spectrum, and it's called 'Instant Embroidery'. John says he doesn't know much about programming yet: he's still learning. Excellent, John; we need some more snippets from beginners, because other beginners get put off if there's only esoteric stuff.

John writes that he has tried this program, and it works. Each of the four segments of the pattern begins with a dot on one corner of the screen. What the FOR...NEXT loop is doing is to count across the opposite side of the screen, while a pattern of lines is drawn between the pairs of points thus created. Here it is...

```
10 FOR n=0 TO 255 STEP 2
15 INK RND*8
20 PLOT 0,0: DRAW n, 175
30 PLOT 255,0: DRAW -n,175
40 PLOT 0,175: DRAW n,-175
50 PLOT 255,175: DRAW -n,-175
60 NEXT n
70 GOTO 10
```

Many thanks, John, we look forward to hearing from you with some more.

And that rounds off this month. The usual plea; I'm running short of stuff. Let's try and get some new contributors, please. I am so grateful to those who week in, week out, send me material, but it's hardly fair on them. So let's have a grand new effort! Please keep all your snippets coming to me; without them I can't put a column together. Please send them to:-

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

See you next month.

+3 D.M.S.

Reviewed By:- David Smith.

Because of the relatively small capacity of 3" discs on the Spectrum +3, many users will have piles and piles of discs either stored tidily in a disc box, or like mine - in unorganized piles around the desk. However, even if you think you've got a good filing system for your discs, I bet that you still need to hunt through your collection of discs to find a particular program.

The double-sided nature of 3" discs doesn't help matters either, as you have to do a CAT for each side of the disc to see if the file is there.

If the above scenario sounds familiar, then Kobrahsoft may just have the answer you've been looking for.

Their Disc Management Software allows the directories of your entire disc collection to be stored in a database. Fast search routines can then be used to search for a file by typing in its filename, or part of its filename. DMS will then tell you which disc that file is on.

DMS provides you with a complete disc managing system, which as well as cataloguing your disc collection also allows you to format discs, erase files, etc.

Upon loading DMS, you are presented with a menu (much like the +3's own menu system) which allows you to enter either the indexing program or the DOS program.

Entering the index program is where the action is, so to speak. You are presented with a screen which has three

main windows. We are now in 'View' mode. Pressing SPACE will take us into 'File' mode and will bring up the list of options at the right hand side of the screen. These options are: VIEW, FIND, UPDATE, INSERT, REMOVE, PRINT, LOAD, SAVE and DOS.

The easy to follow instructions manual instructs me that to create or modify an index we must select the UPDATE option. Now the disc to be indexed must be put into drive A: and the disc number must be typed in. Each file in the index is cross referenced to the number of the disc on which the file is on. The disc numbers need to be recorded on the discs themselves too, so a small label on the case should suffice. Discs are numbered from 0 to 999, with an extension of A or B to denote the side of the disc. So for example, the sequence of discs would be 000A, 000B, 001A, 001B, 002A, 002B, 003A, 003B, etc. While I'm sure many of you have upwards of 100 discs, I doubt if anybody will ever reach the 999 disc limit.

Once the disc number has been typed in and RETURN pressed, DMS loads in the disc's directory and sorts it. It is then automatically placed in the index.

This process should be repeated for all the discs you have in your collection.

However, as this may take some time and computers are prone to crashing at the most inopportune moments, the SAVE option can be used to save the index to disc. You are prompted to enter

today's date so that you know exactly when the index was last saved. The index is saved as a file called INDEX.IDX.

The index of files is displayed in the large window on the left of the screen. The cursor keys enable the user to scroll through its contents at will.

Finding a particular file in your collection couldn't be easier. Just select the FIND option and you are then presented with three further options: DISC, FILE or SPACE.

The FILE option allows you to search the index for a particular file. A very nice feature is that DMS will search the file as each character of the search string is typed in. So for example, if you are searching for the file "LIFE.PRG", when you initially press L, DMS will go off and find the first entry in the index starting with the letter L and change the index display on the left of the screen accordingly. As you continue to type, it 'homes in' on the file you want.

The DISC option prompts you to enter a disc number. 003B for example. The display will then jump to the first entry in the index of disc 003B.

The SPACE option shows you a list of all the individual discs currently in the index. Using cursor keys, you can select which of these discs you wish to interrogate - resulting in that disc's contents being displayed on the screen.

All the Find options are fast, extremely easy to use, and the inclusion of three separate ways to search the index caters for all eventualities.

The INSERT option enables you to insert information into the index manually, mainly so that details of non-standard formatted discs can be included.

If you only want certain files on a disc

to be recorded in the index, for example on your Tasword +3 disc where you only really need the main Tasword file to be included and not its ancillary files, then the REMOVE option can be used to delete individual files from the index. The REMOVE option can also be used to delete entire discs from the index.

The PRINT option allows the index database to be printed out to an Epson compatible printer connected to the Printer port of the +3. There are three printout options, either all the files in disc order, or a print out of each disc giving the number of files on that disc and the free space upon it.

The LOAD and SAVE options are used to retrieve or update your INDEX.IDX file on disc.

The DOS option, which can also be invoked from DMS's initial menu, allows you to access the DOS utility.

The DOS Utility comes in two versions. The first is built into the index program and is stored on the RAM Disc. The second is an independent file on the DMS disc. The only difference between the two is that the independent version can copy 80K of files at one time, while the other can only manage 64K.

The program's layout and operation is much the same as with the DMS index program, with a similar screen layout and the same menu system. The release of version 1.1 of DMS meant that the DOS utility, and indeed the index program, could read a variety of disc formats, from the standard 173K format, to the Amstrad CPC 169K and 178K formats, and even the 192K and 203K high capacity formats. The only commonly used format it can't read is the new 208K format.

The DOS Utility can format discs to the aforementioned formats, with an

option to format the 193K and 203K formats with an extended directory space raising the file limit per disc side from 64 files to 96 files - something very useful when storing lots of little wordprocessing files.

The program also allows you to do file management operations, such as file copying, erasing, renaming and changing file attributes (e.g. the protection systems and archive bits). A file's header data can also be looked at.

The DOS Utility also enables the screen colours used throughout the index and DOS Utility programs to be redefined. Any changes are saved to a file called SET.IDX which is loaded automatically at the beginning of each session - a very useful feature if you are using a black and white telly.

Well, that's the Index and DOS program covered. All that really needs to be mentioned are the Menu programs that are included on the DMS disc. The Menu programs are supplied so that you can add a front end to your discs to make file loading easier.

There are two versions of the Menu program on the DMS disc. The first will create a menu including all the files on the disc with the archive attribute set, while the alternative version of the program enables you to specify which files you want in the menu by including a REM statement in the menu program containing their filenames.

Both versions of the menu program work in the same way, and indeed in the same way as the DMS menu system. As I've said earlier, this menu system is easy to use and many users will find adding this Menu program to their discs a great help.

The package as a whole is well put together. The software is easy to use and

robust. Although the manual is good, I didn't find myself continually referring to it as the on-screen prompts were very clear. J.Eyre, the author of DMS (who can only be described as prolific given his countless other utilities published by Kobrahsoft) has to be congratulated for the program. Kobrahsoft can be contacted at:-

**Kobrahsoft,
Pleasant View, Hulme Lane,
Hulme,
Stoke-on-Trent,
Staffordshire,
ST3 5BH.**

The package costs £14.95 and well worth it too.

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Z80 and BEYOND

By: Peter Finch.

You know, I often get really nervous when reading the modern computer press. The glossy magazines will have you believe that the only viable processor for even the simplest applications is a 100 Mhz Pentium or a superfast RISC machine. I'm being left behind, my skills will no longer be needed.

But that is far from the truth, we all know it because we use Spectrums, SAMs or other Z80 based micros - they do the job we want them to do, at a price we are happy with and, more often than not, in a much more 'user friendly' way.

One day we may well have almost infinite MIPs for zero pounds, but, until that time, I remain convinced that smaller CPUs, those that address the price sensitivity of so many users, still have a life ahead of them.

My main interest in life is in so called 'controllers', small self-contained cards that are used to control everything from domestic heating systems to the irrigation systems of some of the largest farms in Europe and America. But what I have to say will, I believe, apply equally to small home computers and their future - because heaven forbid the day will come when there is no alternative to the Intel/Microsoft mutual support society.

The advantage of CPUs like the Z80 is that they are cheap, they're cheap to interface to, and they are easy to work with. The processor itself costs about one-fiftieth of the price of a Pentium

chip. 32 bit machines will have 2 or 4 ROM and RAM chips per word, compared to 1 for an 8 bit processor, greatly increasing memory costs. In fact, an 8 bit processor exactly matches the bus width of the vast majority of memories and peripherals. An 8 bit bus uses memory efficiently (handling byte data in a 16 bit word is often wasteful unless careful design work is done which in turn adds to the price).

Simpler circuitry, with fewer components, can be used. 16 and 32 bit buses are often used to move more data in parallel. A wider instruction word, handled in a single machine cycle, means more complex operations can be accomplished in less time. Larger addresses can be used efficiently, giving the machine access to more memory. The benefit is speed, but at the penalty of more cost. It is also true to say that, more often than not, only one byte of a word needs to be read or written to perform the task you have in mind - reading 16, 32 or even 64 bits at a time may not take longer, but the extra memory support needed has to be paid for somewhere along the line.

The Z80 has, essentially, remained unchanged from the original version introduced in the mid-70s. Now CMOS versions are common, and clock rates have skyrocketed. Zilog's newest offering I'm told runs at 20 Mhz. This speed is no panacea - it comes at the price of expensive ROMs and RAMs. Still, even

at 6Mhz, the Z80 has respectable performance as the SAM proves so well. It would be a terrible Windows machine, but is more than adequate for an awful lot of everyday computing.

The Z80 itself is attractive due to its low cost and wide availability. It's pretty easy to find Z80s for less than £2 (I've even seen them at a show for less than £1). Tools are everywhere. Though its index instructions are a little crude, it is a far better C machine than many other small processors.

The Z80 in isolation would be a dead-end line. What makes it interesting is the 'high integration' derivative CPUs spawned by the architecture.

The 64180 is a Hitachi-supplied Z80 core with numerous on-chip 'extras'. Zilog's version is the Z180, which is essentially the same chip. At the moment, Zilog sells them running at speeds of up to 15 Mhz.

The 64180/Z180 microprocessor also integrates many of the functions traditionally assigned to peripheral circuitry onto a single chip. The designers picked an architecture compatible with the Z80, giving Z80 users a completely software compatible upgrade path. Old Z80 designs can be converted to the 64180 with essentially no loss in software investment. New designs will benefit from the processor's low cost, powerful instruction set, minute power consumption, and high level of integration. As I've said, I'm more into controllers where these aspects become very important - but believe me, they can prove just as important to the computer designer.

64180 chips include two 16 bit counter/timers, programmable refresh and wait state generation, a pair of DMA controllers, and three serial ports with

on-chip baud rate generation. Toss in a little memory and some parallel I/O and you have a complete computer.

Like the Z80, the 64180 supports 16 bit I/O addresses. Whenever an IN A,(C) or OUT (C),A instruction is executed, both the Z80 and 64180 issue the contents of C as the low order port address, and the contents of B as the high 8 bits of the address. Unlike the Z80, for which few users ever needed more than an 8 bit address, 16 bit port addresses are crucial to the 64180/Z180 chip's operation.

The 64180's internal peripherals are all accessed via reads and writes to I/O ports. Each device is assigned a set of unique port addresses, whose upper 8 bits is always zero. In other words, to read or write an internal I/O device your program must issue an IN or OUT with a 16 bit port address, and that address must be less than 256.

The 64180 reserves 64 I/O addresses for dealing with the internal I/O addresses. On reset, these addresses are from 0 to 63. It is possible to set the starting address of the I/O registers to any of four values: 0, 64, 128, and 192. This is particularly useful if the internal register conflicts with a port in the user's external hardware.

The 64180 permits dynamic selection of several bus parameters, including memory wait states, I/O wait states, and refresh rate.

Like the Z80, the 64180 automatically generates refresh cycles to keep dynamic memories alive. Now that statics are available inexpensively in large configurations, refresh just degrades processor performance in control applications so, on the 64180 at least, the programmer can select the refresh rate. Refresh can be altogether disabled if desired.

The Refresh Control Register enables refresh, sets the rate, and optionally adds a wait state during refresh for slow memories. The fastest possible refresh is set at reset with the wait state enabled. While nicely Z80 compatible, this results in a significant performance degradation. If refresh is not needed, it should be disabled.

The 64180's refresh controller generates an 8 bit refresh address (the Z80 generates a 7 bit address). Unfortunately, 1 Mb dynamic RAM chips all need a 9 bit refresh address. It's pretty easy to place a divider on bit 8 of the address to generate refresh bit 9.

The 64180 has two independent 16 bit timers that both count the CPU's clock. Each can be programmed to generate an interrupt when the count reaches zero. The timers are automatically reloaded with an initial value at a count of 0.

Each timer has a 16 bit data register that can be read or written to set/examine the current count value, and a 16 bit reload register that is loaded into the data register when a count of 0 is reached.

Using the timers is quite simple. The data registers are set to an initial value, the reload registers are set to the reload value (usually the same number as the initial data register contents), and the proper mode is set in the Control register.

The 64180 contains three serial devices. Two of these are traditional asynchronous UARTs (ASCII 0 and ASCII 1). The third is a clocked port for synchronous applications.

Each ASCII (standing for Asynchronous Communications Interface) supports full duplex, 7 or 8 data bits, 1 or 2 stop bits, all forms of parity, some modem control signals, and separately controllable baud

rate generation. Interrupts can be generated on a received character, data error, or transmit buffer empty condition.

The clocked Serial I/O port (CSI/O) is a simple synchronous port that supports half duplex 8 bit communications. It is not complete enough to drive SDLC or other complex synchronous links, but can drive the serial bus used by the 8051 and other processors.

Like the Z80, the 64180 can run in one of three interrupt modes (0, 1, and 2). In addition, it supports a number of new interrupt sources.

Four external sources of interrupts are available. NMI and INT0 correspond with the Z80's nonmaskable NMI and maskable INTR inputs. These behave in exactly the same manner as on the Z80. INT0 can run in mode 0, 1, or 2, depending on the selection made via the IM instruction.

Two new external inputs, INT1 and INT2, always function in mode 2 (vectored), regardless of the specified IM mode. When asserted, the CPU branches to a table to fetch the address of the processing routine.

Similarly, all interrupts from internal I/O devices are always handled in mode 2.

On the Z80, all mode 2 vectors are taken from a table in the memory page specified by the setting of the I register (which can be accessed by the LD I,A instruction). The interrupting device must put the low order 8 bits of the vector address on the bus during the interrupt acknowledge cycle. This remains the case on the 64180 for the external INT0 interrupt source. However, the INT1, INT2, and internal devices work somewhat differently.

A new register (IL) specifies bits 5, 6,

and 7 of the vector table for INT0, INT1 and internal interrupts. The upper 8 bits of the vector are still given by the I register, just as on the Z80. Note that INT0 does not use the IL register in forming the vector address, to maintain Z80 compatibility.

INT1, INT2, and the internal interrupts are assigned fixed offsets from the start of the table formed by I and IL.

The 64180 processor runs every Z80 instruction exactly as a Z80 does, though a bit faster. All registers are handled the same, all flags are identical (which is not quite the case between the 8085 and Z80), and all addressing modes are the same. This makes the transition to the 64180 for Z80 programmers quite easy. A few new instructions are useful in some applications.

The SLP instruction puts the 64180 in an ultra low power mode. Sleep mode can only be exited by the receipt of an interrupt, or by reset. SLP can also be used for ultra-low latency response to interrupts, as any interrupt during a SLP just exits sleep mode without executing an interrupt cycle.

An 8 bit unsigned multiply instruction gives a 16 bit result. Using only 17 T-states, it is a very fast way to multiply two small numbers. It takes any register pair (BC, DE, HL, or SP), multiplies the upper register by the lower one, and returns the result in the pair.

The four versions of the TST instruction all perform non-destructive bitwise ANDs of the argument against the accumulator. TSTIO takes as its argument an 8 bit I/O port address. The upper 8 bits of the 16 bit port specifier are automatically set to 0.

One of the biggest advantages of a 16 bit processor over an 8 bit one is its ability to address a large address space.

Most 8 bit computers are limited to 64k of memory, whereas a 16 bit CPU generally supports 1 to 16 Mb. The memory may be cumbersome to access, as in the 8088 series, but it is available. A large memory space is important for big data structures and programs.

The MMU is the mechanism by which the 64180 can access an address space larger than 64k, but still maintain compatibility with the Z80 instruction set. All instructions, in all modes, always issue 16 bit addresses. The MMU converts every one of these 16 bit addresses to 20 bits.

The memory connected to the 64180 is its 'physical memory'; it is the entire universe of memory available to the processor. The memory that can be addressed with any one map, or configuration, of the MMU is called the "logical" address space. Every address generated by a user's program is a logical address. The MMU's role is to translate these logical addresses into physical ones. If, for example, the user's program tries to reference location 0, this is a reference to logical address 0. The actual, physical, address accessed will be a function of the mapping of the MMU. It may indeed use physical address 0; on power up, the MMU translates every logical address to exactly the same physical address (which simulates the Z80).

Every address reference made by a program is passed through the MMU before being placed on the CPU's pins. If the address matches a range previously programmed into the MMU, then the MMU will add an offset to that address, forming the physical address. Since the offset is a 20 bit number the device can access up to 1 Mb of memory.

The 64180's MMU lets the user

segment the memory into up to three different areas. For instance, references to logical addresses 0 to 3FFFh could access physical addresses 0 to 3FFFh, references to 4000h to 7FFFh could access physical addresses 10000h to 13FFFh, and the last half of the logical space could access physical addresses 40000h to 47FFFh. Virtually any combination is possible.

A more complete discussion of the MMU is beyond the scope of this article. Many vendors have helpful application notes. Some compilers even automatically support MMU, remapping it dynamically to let you code huge programs.

The 64180/Z180 is not the only high integration derivative of the 64180. Both Zilog and Toshiba sell a number of Z80-like devices with differing mixes of peripherals and memory. The range of processors grows daily.

Both Toshiba and Zilog sell the 84013 and 84015, which are Z80 cores with conventional Z80 peripherals integrated on-board. While not as popular as the 64180/Z180, these processors are natural migration paths for current designers of Z80 type equipment wishing to reduce systems costs.

Both the 84013 and the 84015 include one SIO (Z80-specific Serial I/O), and one CTC (again, a Z80-specific timer part). The SIO and CTC are functionally identical to the discrete chip SIO/CTC used in so many older designs. In addition, the newer parts include a watchdog timer and clock generator.

The 84015 comes (unfortunately, to my way of thinking) in a 100 pin quad flat pack. To take advantage of the extra pins the vendors added in a Z80-like PIO (parallel I/O) port, with 16 parallel lines and 4 handshaking lines.

Zilog and Toshiba sell a number of other Z80-like parts, which are of more interest to our hardware brethren than to programmers. The 84C50 is a Z80 with 2k of RAM. The 84C01 is a Z80 with integrated clock circuits.

Toshiba's TMP 90 line are properly not Z80 compatible, as the machine code instruction encoding is different than the Z80. However, strangely, it does maintain source compatibility, so could be considered Z80-like. The TMP 90 line includes dozens of family members, each having a different mix of peripherals and on-board memory. Typically, a TMP 90 chip comes with ROM (up to 32k), RAM (up to 1k), 4 to 6 analog to digital channels, one or more timers, parallel I/O, and DMA. Pulse width modulation channels (worthy of an article in themselves) and zero crossing detectors are also included.

The TMP 90 chips are especially nice because of their on-board ROM and RAM. This is a cheap way to make high volume single chip systems. Some of the chips come in PROM versions, making prototyping much more economical.

And that concludes the look at Z80 compatibles. The only one I've not covered is the Z380 and that is because, as yet, I've not used it. But, if the Zilog specs are anything to go by, it may soon emerge as a real contender in the computer market.



SHORT and LONG

By:- Ettrick Thomson.

SAM has two kinds of IF statement: the One-line (short) IF and the Long IF.

The One-line IF appears in one Program Line, i.e. a piece of program beginning with a line number and ending with a Newline (carriage return); such a line may, of course, occupy more than one screen line in a Listing. A line may have several statements but only one can be an IF statement, and it must be the last statement; but, as discussed below, an IF statement can include nested IF statements.

There are two forms of IF statement: the first is:-

IF [C] THEN [S] (1)

where [C] is a condition and [S] a sequence of one or more statements, separated, as usual, by colons, and terminated by a Newline. Example:-

IF x>1 THEN PRINT x: LET y=x*x

If the condition is true i.e. if x is greater than one, the sequence [S] is executed, but if it is false, no action is taken. Conditions can be quite complicated, using AND and OR and NOT and brackets, but these refinements are not dealt with here.

The other form of One-line IF is:-

IF [C] THEN [S1]: ELSE [S2] (2)

where the statement sequence [S1] is terminated by ': ELSE' and [S2] by a Newline. One or other of the sequences [S1], [S2] is executed: [S1] if [C] is true, [S2] if it is false.

The sequences [S1], [S2] can include any type of statement, including IF statements; as with the Line itself, only one can be an IF statement, and it must be the last. With these nested IF statements, that's where the fun begins. It would be quite impracticable to discuss every variation, so some are discussed to show principles.

An often-used IF statement has the form:-

IF [C1] THEN [S1]: ELSE IF [C2] THEN [S2]: ELSE IF [C3] THEN [S3] (3)

which can have as many ELSE IFs as you please; none of the [S..] can include IF statements. The SAM User's Guide says that the "the condition ELSE IF has a special meaning": be that as it may, the effect of such a statement can be explained by giving ELSE and IF their separate, normal, meanings. When such a statement is interpreted, [C1] is first looked at: if it is true, then [S1] is executed and the rest of the statement is ignored; if it is false, then the interpreter passes on to consider the statement that follows the (first) ELSE, namely

IF [C2] THEN [S2]: ELSE IF [C3] THEN [S3]

So [C2] is examined: if true then [S2] is executed; if false then the interpreter deals with:-

IF [C3] THEN [S3]

The upshot is: if all conditions are false, nothing happens; if one or more is

true, then one - and only one - of the sequences [S..] is executed, namely that where its [C..] is the first to be true when examined from left to right.

The IF statement of (2) allows a choice between two courses of action; that of (3) a choice between as many as you please. The ON statement also allows a choice between two or more, but is very much limited; you should, however, consider it if your program has to make choices.

If the sequence [S1] in (2) contains a nested IF (which may itself contain nested IFs) things can get very complicated. In interpreting IFs, and, more importantly, in designing IFs to do what you want to do, some form of display is invaluable. A flow diagram is probably best, but there is a form, using indentation, that is helpful.

```
A. IF [C1] THEN [S1]
   IF [C2] THEN [S2]
   ELSE [S3] (4)
```

```
B. IF [C1] THEN [S1]
   IF [C2] THEN [S2]
   ELSE [S3]
```

These are NOT examples of actual program. The nested IFs are indented, and, most importantly, each ELSE is vertically below the IF it belongs to. So, if [C1] is false, nothing happens in A, but [S3] is executed in B; if [C1] is true and [C2] false then [S1] and [S3] are executed in A, but [S1] is executed in B. A One-line IF derived from these would seem to be:-

```
IF [C1] THEN [S1]: IF [C2] THEN
[S2]: ELSE [S3] (5)
```

Does this represent A or B? It represents A, because when the interpreter meets the ELSE, it looks back for the nearest un-ELSEd IF and finds IF [C2]. Can B be represented by a One-line IF? With some

low cunning, it can.

```
IF [C1] THEN [S1]; IF [C2] THEN
[S2]: ELSE: ELSE [S3]
```

An ELSE followed by a 'null statement', i.e. followed merely by a colon, is inserted; the first ELSE will be associated with IF [C2], but if [C2] is false no action is taken. The second ELSE is associated with IF [C1], as desired.

If the command LIST FORMAT 1, or LIST FORMAT 2, is obeyed, the screen listing looks like (4), with nested IFs indented; but unfortunately ELSEs are not always vertically below their IFs.

Now for the Long IF. In the One-line IF a Newline not only terminates the Line, but also terminates the IF statement and this double role can make things awkward. The Long IF introduces a new keyword END IF (can be entered as one or two words, but will be listed as two). This terminates IF statements so that, among other things, an IF statement can be spread over several program lines. Here is example B from (4) realised using a Long IF, with the indentation produced by LIST FORMAT 2:-

```
10 IF [C1]
20 [S1]
30 IF [C2] THEN [S2]
40 ELSE [S3]
50 END IF
```

A Long IF needs some warning to let the interpreter know that a Long IF is to be handled: this is done by omitting the THEN between condition and statement, as in Lines 10,20, which could, in fact, be combined to give

```
10 IF [C1]: [S1]
```

with a colon replacing the THEN. Line 30 is a One-line IF, terminated by its

Newline, which shields the IF from the ELSE in Line 40. This example shows that a Long IF can include nested One-line IFs; it can also include Long IFs, each with its END IF; Line 30 could be replaced by:-

```
30 IF [C2]: [S2]: END IF
```

But a One-line IF cannot include Long IFs.

Simple IF statements can usually be handled without trouble by One-line IFs. With anything complicated, the flexibility of the Long IF makes it much easier to get it right. Even then, it may be wise to make a test program with the same IF structure, but with simpler conditions and statements. A simple form of condition arises from the fact that SAM (and Spectrum) when handling a logical expression (such as those in IF conditions) derive a numerical value, 1 for true, 0 for false.

You may use an arithmetic expression for the 'condition' of an IF statement: if its value evaluates to zero, this will be treated as a false condition; anything other than 0 (not merely 1) will be treated as true. So:-

```
IF x THEN ...
```

is equivalent to

```
IF x<>0 THEN ...
```

and

```
IF NOT x THEN ...
```

is equivalent to

```
IF x=0 THEN ...
```

Many of you who started with ZX81/Spectrum Basic will be familiar with this shortening of IF statements because many programmers used these to reduce the amount of valuable memory a line used up.

FORMAT

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RGB TO SAM COLOUR CONVERSION

By:- Kevin Woodbury.

This is a small program that I wrote last year to help translate colours when I was converting an Atari ST program to my SAM. The ST's colours were given in the article as Red/Green/Blue values which did not make sense to SAM as it stores its colours in a totally different way. Even if you don't have a real need for the program, it is still interesting.

The program takes in a value for R, G and B and then works out the SAM palette number for the nearest colour match and prints it together with a bar of colour as an example. The program works for most colours, but not all - and I must admit I'm not quite sure how to improve it.

```
10 MODE 4: PALETTE : CSIZE 8,
8: CLS #
20 HEAD_UP
30 PRINT "You may know that
the values written to the
SAM's CLUT port are not
the same as true RGB
values - because
the bits are mixed up
This program converts
proper RGB components to S
AM palette values so that y
ou can use them in your pro
grams."
40 REM SAM Palette to RGB tab
le
50 LET S=0,G1=64,R1=32,B1=16,
H=8,G0=4,R0=2,B0=1
60 LET back=10: LET C$="Red":
GETVAL: LET R=N
70 LET back=12: LET C$="Green":
GETVAL: LET G=N
80 LET back=9: LET C$="Blue":
GETVAL: LET B=N
```

```
90 REM Now print the results
100 HEAD_UP
110 CONVERT R,G,B,S
120 PRINT "R = ";R
130 PRINT "G = ";G
140 PRINT "B = ";B
150 PRINT "SAM Palette number
"; S;
160 PALETTE 0,0 LINE 151: PALE
TTE 0,S LINE 60: PALETTE 0
,0 LINE 40
170 PRINT AT 21,0;"Press Any K
ey To Continue": PAUSE 10:
PAUSE : RUN
180 DEF PROC CONVERT Red,Green
,Blue, REF S
190 LET HB=0
200 LET GX=(G1*(4=(GREEN BAND
4)))+(G0*(2=(GREEN BAND 2)
)),HB=HB+(1 BAND GREEN)
210 LET RX=(R1*(4=(RED BAND 4)
)))+(R0*(2=(RED BAND 2))),H
B=HB+(1 BAND RED)
220 LET BX=(B1*(4=(BLUE BAND 4)
)))+(B0*(2=(BLUE BAND 2))),
HB=HB+(1 BAND BLUE)
230 LET S=GX+RX+BX
240 IF HB THEN LET S=S+H
250 END PROC
260 DEF PROC HEAD_UP
270 CLS : PEN 15: PRINT TAB 7;
PAPER 11;"COLOUR CALCULATO
R"; PAPER 0; TAB 1; PAPER
10;"CONVERTS RED/GREEN/BLU
E VALUES"; PAPER 0; TAB 4;
PAPER 12; PEN 0;"TO SAM P
ALETTE NUMBERS"
280 END PROC
290 DEF PROC GETVAL
300 INPUT "Please Enter "; PAP
ER BACK;"C$"; PAPER 0;" V
alue (0 to 7): ";N
310 IF N<0 OR N>7 OR N=7
THEN ZAP : ZAP : ZAP : GOT
O 300
320 END PROC
```



YOUR LETTERS

Dear Editor,

Are you having problems getting **FORMAT** out? I had come to the conclusion that it had folded when the June issue was so late.

As I am writing can I make a suggestion - I happened to look through the December 1994 issue this morning and it includes a letter from someone (K.H.Powley) asking that some items from the very early, and now out of print editions of **FORMAT** be reprinted in the current issues. The Editors reply was that he had enough new material and that it would not be fair to long standing members who already had the items.

Would now not be a good time to look at reprinting some of these articles? I noticed that the June issue was eight pages shorter than normal.

Yours sincerely, J.Woodhead.

We have had a number of problems over the past few months and although those are now behind us it will take a few months for us to catch up.

I'm against re-printing articles 'as-is', even if the original is now out of print - it would not be fair on those members who have been with us from the early years. However, there are the odd exceptions, mostly where there are articles which could be updated.

The smaller issues over the last few months have not been caused by lack of material (although we are always in urgent need of more contributions so we can produce nice and varied issues) but because of a fall off in advertising. I try to keep issue sizes roughly equal even though advertising revenue goes up and

down from time to time but over a longer period things do have to balance out.

Until things pick up again in the autumn I'm targeting on 32 page issues although there is something special planned for next month (if I can get this month's issue done first that is). **Ed.**

Dear Editor,

I am rather surprised at the lack of further information on hard drives since they have been used on the SAM, can you possibly stir your readers to part with any views or knowledge. I am using a 130Mb IDE hard drive through an SD Software Interface with Hdos, Hdutil and Hprog. My two main problems are removing duff files and directories. Keep up the good work with the mag.

Yours sincerely, S.R.Povey.

So Mr Povey, am I. SD have sold the hard drive system quite well, but as yet there has been very little material coming forward for **FORMAT** to publish. It seems that most of the owners are too busy stuffing mega-bytes of software and data onto their hard-drives and can't spare the time to write for us.

Hopefully your letter will prompt somebody into doing something for us - however small. **Ed.**

Dear Editor,

Thanks to both of you, Bob and Jenny for the write up in *Your Letters* Vol.10 N°8 of **FORMAT**. I read that Bob has not got a working Spectrum. Well I have two or three 48K+'s and have put new keyboard membranes in them. I will give him one for free, power pack and TV lead

included. Do you think John Wase could pick it up for you on his way home from Birmingham University, it is not far from my home.

Thanking you.

Yours sincerely, S.Round.

Its OK Mr Round, I do have working Spectrums, its just that I don't have a working set-up. If you could see the office you would understand why there just isn't the space at the moment to keep one set-up all the time.

I do however run the Z80 Spectrum emulator on my PC so I've not lost contact with the Speccy completely (perish the very thought) and we still use SAM to run our membership database because it is far easier to modify as needs dictate than a PC database would be.

Thank you for your kind thoughts anyway and glad to hear that you finally managed to get your PLUS D working properly again. **Ed.**

Dear Editor,

It is with great reluctance that I bring myself to write this letter but at this point in time, much as I will always cherish my Spectrum, I find myself spending very little time actually using it and therefore I am not able to enjoy **FORMAT** and realise its potential. I cannot even answer questions regarding articles enjoyed because some months I simply do not find enough time to fully read this excellent publication.

I sincerely hope that you can continue and if there is a dramatic change in my life I look forward to possibly renewing membership to what I consider to be the best magazine available to any Spectrum user! I remain...

Yours sincerely, Peter Goulding.

Thank you for your kind comments, hope you will find more time for your hobby soon. **Ed.**

Dear Editor,

In your June issue you had a letter from Mr John Adams saying that he had heard that issue 54 of SAM Supplement was to be our last.

I'm glad to say that this is not correct. Like yourself with **FORMAT**, we can only produce an issue if there is enough material to make an issue worthwhile and as a result we felt that we could no longer guarantee that an issue will go out as regular as we would like it to be. We therefore decided that rather than cause complications for subscribers by taking long subscriptions it would be easier if subscribers paid for one issue at a time. We will of course continue to publish SAM Supplement for as long as the demand continues, and also to publish it as often as possible.

I hope this will set the records straight with your readers.

Yours sincerely, Dave Tonks.

As I said in my reply to John Adams, his letter was the first I had heard of. Happy to see that the rumours of your demise were unfounded - hope to see you all at the October show. **Ed.**

Dear Editor,

Many thanks for sending the SAM user manual. However, it says very little about disc commands. Is there anything available to cover this aspect of the SAM please?

Also, is there any literature on working the *Flash!* program. I get the opening screen and discovered how to get the pull down menus for this program but that's as far I have been able to proceed.

Finally, I cut the enclosed bit about the millennium bomb from today's Eastern Daily Press, which I thought Jenny might care to have.

Best wishes.

Yours sincerely, Peter Page.

Jenny says thanks for the clipping - she has a wonderful file but is always on the look-out for more.

The disc commands for SAM are covered in the SAMDOS or MasterDOS manual, dependent on which DOS you are using. There is also a small manual for FLASH! If you don't have either of these manuals then give us a ring and we will see what we can do for you. **Ed.**

Dear Editor,

Two things enclosed, a letter to the Editor about leap years, prompted by the confusion revealed in the letters page in the July '97 issue of **FORMAT**, and, yet another article about SAM's scaling, with more directly useful formulas. I'm sorry that I hadn't realised that such formulas were possible, otherwise I might have put it all in one article, which would have been much better.

As usual, the text is on disc as *The Secretary* files, but I wonder whether that is necessary nowadays, for surely you must have a scanner. Perhaps you might say something about this in your Editorial. I could well understand recommendations that needed more care in the form in which text is submitted.

I hope you haven't forgotten my article 'IF...THEN...ELSE'. The article 'If Else is 5 foot 2' in the June issue didn't tell you very much. I almost wrote about it, to say that the first version of the program didn't work because it wasn't SAM Basic, since it didn't conform to the syntax rules.

LEAP YEARS

It might help to clear up the confusion by explaining why Julius Caesar's and Pope Gregory's 'system analysts' produced the rules they did.

It all starts with the length of a year: different authorities (such as the *Encyclopaedia Britannica*) give slightly different values, which probably means that 1) the length is derived from measurement 2) it changes. The following analysis assumes a length of 365.242216 days (I forget where this came from).

1. Take a year as 365 days, which is 0.243316 days short, so, after 4.26 years, you are 1 day out.
2. Julius Caesar's average year was 365.25 days, for he introduced the rule of a leap year every 4 years. So his year was 0.00778 days too long, giving a 1-day error after about 128 years.
3. Rule: skip the leap year every 100 years, ie: for years divisible by 100, giving an average year of 365.24 days, 0.002216 days short, and a 1-day error after about 451 years.
4. Rule: have a leap year every 400 years, ie: for years divisible by 400, giving an average year of 365.2425 days, 0.000284 days too long, and a 1-day error after about 3500 years.

Rules 3 and 4 are those introduced by Pope Gregory XIII in 1582, but not adopted in the UK until 1752, superseding the Julian Calendar with its leap year every four years.

Carrying on in the same way, we could have a rule that the leap year would be skipped for a year divisible by 4000, making the average year 365.24225 days, with a 1-day error after about 30,000 years. This figure matches your 32,000 AD, but is critically dependent on the last few figures of the year's length.

These days, we have leap seconds as well as leap years - the last minute of 1996 had 61 seconds, and I think there was a leap second last month or the month before. So if you want your computer clock to be correct to the nearest second, you do have a problem!

Yours sincerely, Ettrick Thomson.

You will never cease to amaze me Ettrick, you are such a mine of information, I certainly hope my mind is half as sharp as yours when I reach your age.

Thank you for the leap year calculations. Certainly I was taught the 4/100/400 year rules at school, but it is wonderful to see that my half

remembered 32,000 AD was about right. It still amazes me is that they were able to work out a system, correct to within a few days at the end of thirty thousand years - all without a single Spectrum to do their calculations on...

Your IF_THEN_ELSE article may well be in this issue, its been short-listed for a couple of months now. If it isn't then it will appear very soon, as will your follow-up on scaling. And yes, it is best to send article on disc, scanning and OCRing material is very long winded and prone to error - in fact on a couple of occasions when discs have not been available it has been much easier to get Jenny to retype the article.

Keep up the good work Ettrick and again, thanks for so many interesting bits and pieces. **Ed.**

Dear Editor,

Please find enclosed my latest subs for **FORMAT**.

I realise that you hear this all the time, but it is difficult to say what I most enjoyed about **FORMAT** over the last year.

I did like SAM Disc Interrogator. This really took me back to the heady days of 1986 to 1989. I would spend hours typing away at the keyboard entering all those programs in the magazines (such as *YS* and the immaculate *ZX Computing*) which the 'clever bods' had submitted to be published. I've got some real crackers on disc here and there although, in my experience of **FORMAT**, most would be too long.

Also, I still have the magazines someplace (probably in the loft).

In 1989 my children started to come along, for me, all things Spectrum have never really recovered since. Although I must say things are picking up a bit now they are a little older.

I would like to see more hardware reviews I think. Such things as the Quazar Surround Sound Interface looked

really intriguing at one of the fairs I attended in 1996 but, apart from some leaflets from that fair, I have not heard a dickie bird since. Incidentally, not a whisper on SAM Clock I cannot fail to notice.

My Spectrum (original 128K Sinclair version) has a DISCiPLE interface (again original) which I have upgraded with a Uni-DOS Rom. I suppose Henk has deserted us for an IBM compatible. Maybe that's why little is heard from him these days.

I hope, that maybe later this year I can obtain an Apple Mac for MAC compatible. I already know of some Spectrum Emu's, so as soon as I can I will try to get hold of one, perhaps write a review for you, if I dare. I am thinking amongst other things, about the long term availability of my Speccy and SAM software of which I have acquired a considerable amount. In any case, I still intend to keep my Spectrum and SAM.

Anyway, here's to your team and another year of **FORMAT**.

Yours sincerely, Dean Shepherd.

If you have some of the old 'type-ins' on disc we would certainly be pleased to see them. True, some were rather large but we could split them over a couple of issues and I'm sure there are lots of readers who would welcome the chance to get their teeth into a meatier program.

Many of the listings in the old mags were rather bug-ridden, so if you have working versions on disc then all we need is the program on disc and a copy of the original article. Why not give me a ring sometime and you can tell me what you have got.

I do have a few more bits of Uni-DOS Corner which I really must make sure I get type-set very soon - keep your eyes on **FORMAT** for their appearance. **Ed.**

Dear Editor,

I thought it was about time the SAM mags stopped ignoring the Quazar

surround. So I've written a review for you. Enjoy!

Yours sincerely, Stephen McGreal.

I don't think we can be accused of ignoring the Quazar system Stephen, there have been several news items since its release.

Now I have to say that normally a magazine only reviews products that are sent to it for review - don't ask me why, it is just the common practise within the magazine industry. However, because of the high cost, and the low profit margin Colin works with, he has not been able to let us have a Quazar unit for review in the past. This is perfectly understandable and should in no way reflect on either Colin Piggot or the Quazar (which I think everyone who has seen one at one of the Gloucester shows will agree is an impressive piece of hardware).

I've read through the review you sent in, and although it is unsuitable for publication (it is not really a review, more an advert) it could form the basis of something for a future issue. Why not give me a ring sometime and we will see what we can work out.

Oh, by the way, even though the write-up you sent was only a single page, could you please remember that articles/reviews need to be sent as an ASCII file on disc (SAM, PLUS D, DISCIPLE or PC) so we can avoid transcription errors.

Look forward to hearing from you soon.
Ed.

Dear Editor,

What has happened to the series of articles on SAM C? I was following them with interest but they stopped some months ago and then nothing since.

Yours sincerely, Simon Parks.

Big mystery there Simon. Martin Fitzpatrick produced the first 4 parts but then vanished of the face off the earth.

We have written to him, but without success, as I am as keen as you to see the articles continue (even though they are a bit of a headache to edit I can tell you).

If anyone has contact with Martin, give him a prod please, his loyal fans await his next instalment. *Ed.*

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