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FORMAT

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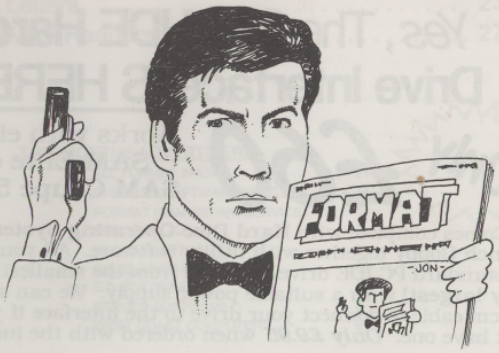

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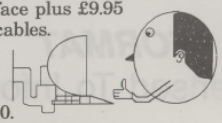
All **S D Software** customers will receive ***FREE*** software updates until the end of 1996 - so there is no reason to delay.

Terms: Payment with order only. Send cheque or postal order, in pounds sterling, for £60.00 for each interface plus £9.95 for our extra length cables. Then add post and packing: UK £1.00, EEC £1.50, rest of the world £2.00. Please allow 28 days for delivery.



S. D. Software, 70, Rainhall Road, Barnoldswick, Lancashire, England, BB8 6AB. Other software still available: See November's advert or send SAE for list.

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FORMAT ISSN 0963-8598

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FORMAT is published by FORMAT PUBLICATIONS.
34, Bourton Road, Gloucester, GL4 0LE, England.
Telephone 01452-412572. Fax 01452-380890.

Printed by D.S.Litho. Gloucester. Telephone 01452-523198.

NEWS ON 4

ARCHIMEDIAN SPECCY

Acorn's Archimedes and Risc PC range of computers can now run Spectrum software with the imaginatively named *Z80Em* emulator from Warm Silence Software (01585-487642). On the newest (fastest) Acorns this appears to run as fast as a real Spectrum and has built-in compatibility with some of the joystick systems (such as the A3010's standard ports) and if need be the mouse can even be used as a joystick.

Software support is good. A tape adapter is available to plug into the printer port (multi-loaders are catered for) and there is even a CD with around 3,000 Spectrum games from the same company. Prices are:- Z80Em £15, tape adapter plus software £20, CD-ROM £15 (when purchased with Z80Em). There is also a BBC emulator available which can be supplied on the same disc as Z80Em at a special price.

NEW PCW

Amstrad have launched a new version of their highly successful PCW computer. The new PCW has 3½" disc drives which are apparently formatted to the MS-DOS/PC standard so allowing the fast interchange of information. Older format PCW disc (well the 3½" versions anyway) can be read on the new machine but can only be written to under certain circumstances.

The new machine can be obtained for £299 on its own or for £399 with an inkjet printer or £499 with the laser printer option. The new versions are bound to sell very well to the growing range of home/office users that want a machine for wordprocessing and other office tasks but do not want to pay out £1,000+ for the latest Pentium type machines. Over the last 10 years Amstrad has proved that the PCW is a good value for money work-horse and the new versions look set to continue the success story of the PCW.

SAM SPARES SERVICE

West Coast have bowed to pressure from users, particularly overseas users, for a proper spare parts service for the SAM Coupé and Elite computers. While many parts are standard, and can be obtained from electronic suppliers like Maplin, there are some items that are only available from WCC's own stock.

If anyone wants items so that they can repair their own SAM then send a list of the parts you require to Format (as we of course act as WCC's mail order agents) together with an SAE and we will send you prices. The only items not available are the slim-line drives for the Coupé.

NEW ZEALAND SOFTWARE

It has been very remiss of us not to pass on the news that Derek Morgan (as F9 Software) is now selling several items of commercial software written by other programmers including a superb graphic adventure called WONDERLAND written by New Zealand programmer Robyn Campbell and priced at only £4.

Send an SAE to F9 Software, 18 Mill Lane, Old Skelmersdale, Lancashire, WN8 8RH for a full list of titles and prices.

Credits:- Guy Inchbald.

URGENT we need your news. Anything you think other people should know about. Each item printed earns the contributor 3 months extra subscription (*please claim when next renewing*).

The Editor Speaks

This January's issue of FORMAT is a bit later than usual. We normally try to have it printed and packed before Jenny finishes for her Christmas break. However, this year, lots of things conspired to prevent that, and indeed it is already the 4th January as I write this. Anyway, better late than never, and may I wish everyone a belated Happy New Year.

This first news for 1996 is that we are launching a new magazine in the next few months. Called FORMAT PC, it is aimed at those users of MS-DOS type machines that are being abandoned by the main-stream mags. I'm referring to users of 8086, 286 and 386 based machines. If you have a Pentium 90 running Windows 95 in 16Mb of memory with all the latest 'multi-media' add-ons then there is plenty in the high-street magazines for you. But not everyone has the sort of money to keep up with the latest fashions in Pentium/P6/P7/P... technology. A Computer is a big investment and people want them to last more that the warranty period.

So, after some market research, the idea for FORMAT PC was born. A magazine that will deal with the older machines in just the same way that ***FORMAT*** has dealt with the Spectrum and SAM since 1987. The magazine will cover programming, hardware and software for people who want to get more out of their machine.

The increased turnover the new magazine will produce will bring added benefits for ***FORMAT*** itself, the most important being that we will again be able to keep our rates at £12 in the UK for another 12 months. The new mag will also allow us to consider advertising in high-street magazines again which will promote the Spectrum/SAM field just as much. It may also allow us to consider attending more shows which we could not justify with just the existing mag.

I am looking for a sub-editor to handle some aspects of the magazine, and of course I'm looking for any articles readers would like to contribute, so if you know a bit about MS-DOS type machines then please get in touch.

This month we are pleased to include a free ticket for an All Formats Fair, a New Year present from the organizer Bruce Everiss (what a very nice man) who by the way recently passed the 250 landmark (no, I'm not talking about his age silly, but the fact that last November he clocked up his 250th show). There are venues within easy reach of most parts of the country (if any overseas reader plans to be in the UK then just drop us a line and we will send you a couple of tickets). The ticket is valid for any show, not just the dates that are printed on the front, and although they are now rather PC oriented I'm sure you will find plenty of things to see. Haydock (North West) usually has a SAM stand run by Derek Morgan of SAM PD and I am hoping to have a stand at the National Motorcycle Museum (Midlands) show on the 11th Feb. For a full list of the dates and venues see the money off voucher printed in this issue.

OK, that is all I have room for this month. Now all I have to do is get this issue off to the printers and then start work on February's - no rest is there?

Until next month.

Bob Brenchley, Editor.

West Coast Computers

West Coast Mail Order,
Format Publications, 34, Bourton Road,
Gloucester, GL4 0LE. England.

Below you will find details of the full range of SAM hardware now available.

CODE	DESCRIPTION	PRICE
	COMPUTERS - Now with extended two year warranty.	
W1010	**SAM *élide*** - 512K - Single Drive. The latest computer in the SAM family. 512K RAM, Single Drive Machine, Built-in Printer Interface. ***Last Few***	£199.95
W1011	**SAM *élide*** - 512K - As above but with Dual Drives fitted. ***Last Few***	£259.95
W1020	**SAM *élide*** - 512K - Single Drive. As W1010 except we supply scart to scart lead instead of TV modulator so you get the best possible picture from your SAM.	£199.95
W1021	**SAM *élide*** - 512K - Dual Drive. As W1011 except we supply scart to scart lead instead of TV modulator.	£259.95
	INTERFACES (work with both SAM *élide* and SAM Coupé unless otherwise stated)	
W1101	SAM Disc Drive Upgrade. Have a second drive fitted to your SAM *élide* or a replacement/second drive for your Coupé. Fitting and return postage included in price. Ring 01452-412572 for instructions on how to send your computer.	£79.95
W1124 ** NEW **	SAM Coupé Disc Upgrade Kit Version 2 - all you need to upgrade to a twin drive machine or to fit a replacement for your existing drive. Needs reasonable soldering skills to fit. Comes complete with all instructions & components. All you need is a standard 3½" drive mechanism.	£29.95
W1125 ** NEW **	SAM Coupé Disc Upgrade Kit - as above but ready assembled. All you need is a disc drive and a screwdriver to fit.	£39.95
W1102	External Parallel Printer Interface - the SPI (for Coupé).	£24.95
W1106	SAM Mouse System. Interface, Mouse and Software. Plugs into mouse port on rear of SAM. More and more software now works better if you use a mouse.	£39.95
W1107	External Disc Drive Interface and Parallel Printer Port (for Coupé).	£44.95
W1108	Internal 256K Upgrade (for older SAMs with only 256K of memory).	£34.95
W1109	*TWO*[UP] allows 2 interfaces to connect to SAM expansion port at same time.	£19.95
W1401	SAM Power Supply .	£24.95
W1402	SAM Power Supply with TV Modulator.	£34.95

Prices valid until 1st May 1996. E.& O.E.

Ordering: Write your order clearly, state your name; full address and phone number and quote your INDUG number (if you are a member) as this helps to speed orders. **Payment**: Cheques and UK Postal Orders, should be made payable to **FORMAT PUBLICATIONS.**

Postage & Packing: Price includes UK P&P. European customers add 15% for delivery, other overseas customers please write for quote. Overseas customers can pay using the ***FORMAT*** foreign exchange scheme.

STOP PRESS We have a very limited number of 512K SAM Coupé computers available. These are brand new single drive machine which we are able to offer to FORMAT readers at a very special price of £145 including UK p&p. They have our normal full 1 year warranty plus our usual extended 2 year warranty on the main board. Place your order right away as we will deal on a strict 'first come - first served' basis.

NEW DRIVES FOR SAM

A Look At The Mk2 Drive Kits By:- Bob Brenchley.

Since West Coast Computers announced the change over to using the 'standard size' drives in SAM there has been a fitting kit available for the DIY types to fit their own drives. One of the problems with this kit has been the level of soldering skills required to fit one. Well now things are being made easier with the launch of the MKII kit.

With the first version of the kit it was necessary to remove one of the connectors on the main SAM board. Not too difficult if you were used to desoldering components, but a job that was definitely not recommended to the beginner. Why was this tortuous task necessary I hear you ask. Well you see, the cost of producing a special PCB for the new interface, in the small quantities that were needed, was considered prohibitive. Being very frugal minded, WCC wanted to re-use an existing FDI (Floppy Disc Interface) board which had been used with the old slim-line drives. On the slim-line drives this FDI laid flat, but there was not enough room for it to lay flat with the new type drives and still plug into the connector on the main board. And so some bright spark came up with the idea of removing one connector and replacing it with a set of straight pins. Hey presto, an affordible upgrade - but one needing skill to fit.

Now, to version two. You will still need to be able to solder fairly well, but the real pig of a job - removing the connector on SAM's main board - is now done away with. There is no need even to remove the main SAM board from the case.

How did they do it? Well that is hard to explain without a lot of drawings, which I don't have space for. However, it basically revolves around bent pins. The new kit comes with a connector, pre-soldered to the FDI board so there is no danger of you breaking the specially bent pins during assembly. This new way of fitting allows the FDI board to sit upright slotting into the existing socket so there is no need to remove it. All wires and connectors are supplied, the only thing you need is solder and a nice fine tipped soldering iron. Not got one? Can't solder? Well the kit is also available fully assembled so all you need is a disc drive and a screw driver and away you go.

An added bonus with the new kit is that you can fit two to a SAM Coupé. With the old version only one kit could be fitted, alright if you still had a slim-line drive to use as drive 2 but if you did not, then the only way to have two drives was to have them fitted through West Coast.

The new kit is both easier to fit and requires far less time to get things up and running. You also now have the ability to fit two drives to the same Coupé in the comfort of your own home. At £29-95 (£39.95 fully assembled) the kit is very good value for money and all you need to add is a standard disc drive which should cost less than £30 (far less if you go to an All Formats show.

NEW!

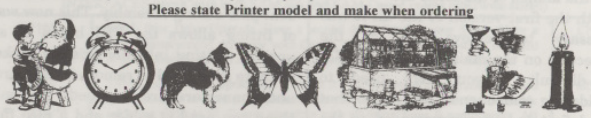
CLIPART FOR THE SAM

Sampler pack available now at only £5.

Contains a 2 disc set of 45 Mono and 15 colour clipart pictures with sample printouts, plus a free massive catalogue, (to be sent out separately around Christmas time).
The catalogue will contains over 1,000 clipart pictures from 30 categories which may be purchased in sets or each individual picture chosen separately.

Most clipart collections were created on the spectrum as Screen$ files and outputted at the time when only 9 pin printers were available.
During the 90's Hi-resolution 24 pin and Ink/bubblejet printers became available at affordable prices, however picture quality has not kept up, one can only print out these pictures on the Sam at Spectrum resolution with 9 pin software.
Building on the success of SC_WORD pro to bring you high quality text output never seen before on the Sam, Steves Software has now developed high quality pictures for the Sam.
Each picture is 12 times the resolution (750x750 pixels) compared to spectrum screen$.
By using special software as used in SC_WORD pro, pictures come out smooth and far less dotty in appearance matching any quality output you would get from PC computers etc.
Below are a few pictures from the Clipart Sampler pack::-

Please state Printer model and make when ordering



You will need any 9 pin printer, Epson/Citizen/Panasonic or Star 24 pin printer or Canon bubblejet printer. Other printers supported soon. You also need a 512K Sam.

SC_WORD pro £29.99

To complement the clipart pictures why not add beautiful crisp sharp text with no jaggies the same quality as PC computers can produce, you will not find any other word-processor like SC_WORD pro.

For SC_WORD to work you will need a 512K Sam, MasterDos disc operating system (extra £12 for a copy). Any 9 and 24 pin printer, and bubble jet except Deskjet and other 300dpi ink/bubble jet printers.

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01223 235150
(after 6pm)

Buy now pay later.

The ideal way to pay for a Christmas present, just phone the number below, which items you would like, your name and address, then a couple of days later first class you should receive the software with payment slip for which you have upto 1 month to pay back.

SPECIAL CHRISTMAS OFFER
If you purchase SC_WORD pro by 23 December 95, you will receive a free copy of the Clipart Sampler pack as above.

CLIP-ART FOR SAM

A Review By:- Carol Brooksbank.

Steve's Software of Cambridge are offering a new collection of clip-art software for Sam. Although it was originally intended for use with the publisher's SC_WORD PRO, the collection stands alone, because printing software is supplied, so it can be used to add illustrations to any text document produced with any word processor.

Your basic purchase is the sampler pack, at £5, which brings you the printing software and a sample collection of 45 monochrome images and 15 in full colour. The discs are accompanied by an A4 instruction sheet and a printed sample of all the images.

When you boot up the monochrome sampler disc, you are given a choice of 9-pin, standard 24-pin, 24-pin with ESC P2 compatibility, or Canon bubble-jet printer drivers, each with the option of monochrome or colour. The 24 pin drivers at present support Epson, Citizen, Panasonic or Star. I gather that a wider selection of printer drivers is planned for the future, so it is worth a phone call to the publisher if your printer is not in the list yet.

I keep my 24-pin printer permanently set to colour, even when I have a single black ribbon installed, so I selected the colour driver. I soon discovered that, unless you have the four colour ribbon installed, the colour software crashes. If you have a one colour ribbon you must select the monochrome driver, even if the printer dip-switch is set to colour. With a colour ribbon and colour driver, you can opt to print the monochrome images in black, cyan, magenta or yellow.

The colour images are in full colour and are quite delightful. The colours are soft and delicate, especially when printed with a bubble-jet as they are in the sample printout which came with the package. Even with the 24-pin, though they were a little darker, they were still not harsh.

Print quality is first class, in both monochrome and colour images. If you have an ESC P2 compatible 24-pin, or a Canon bubble-jet, you have a choice of three sizes of printout. With all other printers, only the small and medium sizes are available. Even with a 9-pin printer the quality is very good, but with

a 24-pin or bubble-jet you have high resolution printouts, and the result is very professional.

The software is very easy to use. The directory of images on the disc is displayed, and you select the image number you want to print. This is loaded, and you are presented with an options menu. You can select image size, position on the paper (in mm. from top and left side), and colour if you are using a monochrome image with colour ribbon. The width and depth of the printed image in the size you have selected are displayed, together with the maximum top and left positions which will allow the printout to fit on the paper.

You can then choose to dump the image, or select a new one. If you want an image from a different disc, you press ESC, insert your new disc, and press key F4. The new disc directory is loaded and presented for selection.

So far, there are another 9 discs of images available for purchase - each with 49 images per disc, and each comes with a sheet of printouts. They comprise: Christmas (a good selection of Santa, trees, parcels, Crib scenes etc.); Communication (phones, satellites, fax machines etc.); Computer technology (computers, discs, printers etc.); Office equipment (filing cabinets, sellotape, calculator, drafting equipment etc.); Home appliances (video recorder, toilet, TV, camera etc.); Music/film (Speakers, tape recorders, musical instruments, film reels etc.); Religion/faith (Christian symbols, birthday/anniversary, Zodiac signs, Halloween etc.); Animals (birds, snakes, dogs, cats, farm and wild animals); Signs (recycling, Secret, Stop, Sale etc.)

Each disc costs £2, and there is an overall p&p charge of £1.50 per order, unless you are spending £10 or more on discs, in which case postage is free.

On each of the sample printout sheets, there is a heavy line across the display of images, and all those below the line can be purchased as full colour images at 50p each. You can mix or match from any of the sample sheets. Again, there is a p&p charge of £1.50, unless you are ordering £10 worth of images.

In the near future Steve's Software plans to publish a catalogue illustrating 1000 images, and from this you will be able to select the ones you want, at 25p per monochrome and 50p per colour image, with the same p&p charge.

All of which makes this a very versatile and useful collection. I particularly like the prospect of being able to select just the clip-art you want from a catalogue. In every clip-art collection I own there are dozens of images for which I have no use, and some I would dearly like to have are missing.

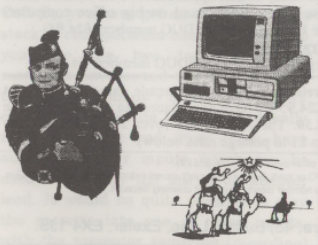
And I have discovered that this collection is even more versatile than the publishers intended. If you are using a monochrome driver, the full image is displayed briefly on loading, with a cropped copy displayed on the menu screen. If you break into the Basic (just hit ESC when at the menu), change the final CLS on line 30 to STOP, and then hit F4 to load the directory and select an image, the program will stop with the full image displayed on screen, so you can save the SCREEN$. Using SAMPAINT, you convert it from a MODE3 to a MODE4 screen, after which you need either to halve the width or double the depth of the image - to restore the original proportions. It gives you a choice of two sizes, which can be printed much larger than the hi-res sizes

available with the clip-art drivers. You need to select the default palette, and replace the colours with black, to get back to the original monochrome image, and you may have to fill in some odd pixels which get lost in the process, but you can then colour the image in if you wish. Several of the images from the Christmas disc found their way onto my Christmas cards by this method.

There is a slight American bias, as there always seems to be in these collections - American style mail-box, skunk and chipmunk among the animals, 'Realty Co.' on the For Sale board - but it is not so marked as in many collections I have seen - and there is an old-style English phone box!

This is a very useful, high quality, and versatile product, which I think will appeal greatly to those of you who, like me, like to use a lot of illustrations - especially if you share my total absence of talent for producing my own.

Enquiries to Steve's Software, 7, Narrow Close, Histon, Cambridge, CB4 4XX. Tel: 01223 235150 (6-9p.m.).



FORMAT

SAM REPAIR SERVICE

We are pleased to be able to offer readers an official, West Coast approved, repair service for SAM Coupé and SAM élite computers and add-ons.

PRICING

Because every fault is different we don't think it is fair to charge a fixed rate. When we receive a machine it is tested and a quote is sent to you for the repair. If you decide for some reason not to go ahead with the repair you are under no obligation.

Pack your machine well (we will use your packing for its return). Please phone us on 01452-412572 for advice on dispatch (we can even arrange collection). In many cases we can also give an estimate over the phone. All repairs returned by overnight carrier so tell us which days there will be someone in to sign for the parcel. Please quote your INDUG membership number and give a evening contact phone number.

Send your machine to:-

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(Producers of OUTLET monthly since 1987)

SAM GAMES AVAILABLE FROM REVELATION

SOPHISTRY

Our latest & BEST licenced game. Originally produced for the Spectrum by CRL, and now brilliantly converted for SAM, Sophistry is a game that is big, perplexing, colourful, frustrating, musical, bouncy, and above all DIFFERENT (and it even has the Spectrum version built in so you can take a trip down memory lane).

£9-95 (£8-95 to INDUG members)

T'N'T

Written by industry mega-star Matt Round - A game packed with humour☺, colour☻, sound♪ and *above all* **ACTION!**

Loosely based on **Bomb Jack** (the game SAM owners have most requested over the years). As well as the normal one player game, **T'N'T** has gone one better by giving you ***TWO*** player action - competing against each other, in full glorious technicolour - at the *same* time. It even has a novel feature in a SAM game - a High Score Table, how many others have that?

Avoid the meanies, collect the bonus points, Jump, Hover, Fly - what more do you want???.

£9-95 (£8-95 to INDUG members)

GRUBBING FOR GOLD

We spent a lot of time listening to what our customers wanted. And here is the result. You wanted a family game - ***you got it,*** you asked for colour and sound - ***you got it,*** you demanded long term interest - ***you got it.***

GRUBBING FOR GOLD - the most advanced, the most playable, the most enjoyable quiz game since the legendary Quiz Ball. They said it could not be done - they said bringing a TV quiz show to SAM would not work. Well let them eat their hearts out because YOU GOT IT....

This game has everything. Animated and entertaining. Hundreds of questions, on a wide variety of subjects at levels to suit most people. It even has a question editor program on the disc so you can create your own sets of questions or alter those already on the disc. GRUBBING FOR GOLD will really keep the family playing during the long winters nights. This is the game you can never grow out of.

£9-95 (£8-95 to INDUG members)

More Games Coming Soon

Send SAE for full list of available games.

REVELATION FOR THE *VERY BEST* IN SERIOUS SOFTWARE

THE SECRETARY - The most advanced word-processor for SAM, powerful, versatile and easy to use. ***NEW Version 1.5 Available Now*** - The BEST just got better £14.95 (INDUG £12.95)

COMET Z80 ASSEMBLER - The SAM assember many professionals use, yet easy enough for the beginner - so why settle for second best? **£29.95 (INDUG members £21.95)**

DRiVER
The Graphical User Interface for SAM

DRiVER works with the SAM Mouse (no mouse should be without one) or Keyboard. It provides a full WIMP (Windows, Icons, Menus, Pointers) system that puts you in full control of your SAM. Comes complete with many built-in utilities and ready to run applications. Full manual and a disc-based tutorial. DRiVER gives you the ease of use only found on big office computers before. So easy to use yet so powerful. ***Fantastic Value £29.95*** (INDUG members ***£24.95***)

Now Includes FREE Copy Of DRiVER's Extras Disc 1

DRiVER's Extras Disc still available for existing users at £5.95 (INDUG members £4.95)

SCADs PD Yes, at last, we are please to re-release SCADs - the arcade game development system for SAM. Previously sold by Glenco at £24.95 we have now placed the software into the Public Domain so the disc costs you ***Only £2.50***. The full manual (over 200 pages) is also available for £12.95 (overseas please add an extra £1 to postage rates below)

- All prices include UK postage and packing (Europe please add £1, other overseas please add £2).
- Payment by UK cheque (made payable to Revelation Software), PO or cash. Sorry but we can't accept orders by Euro-cheque or Giro.
- Please Quote INDUG membership number clearly on order if claiming discount.
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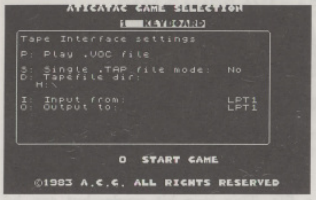
EMULATION Exchange

By:- Peter Collier

Generally, if you can use a real Spectrum, you can use an emulated one. The whole point of an emulator is to be as close as possible to the real machine. Having said that, there are problems caused by hardware differences. Different disc formats is a common problem. Different input devices another. Add to this things like microdrives and cassette tape, and the problems become more obvious. How do you use a microdrive program on a machine which has no microdrives. Hopefully, this article will cover some of these anomalies. Z80, the PC emulator available in the UK through B.G.Services, will be used as a reference, but many of the details explained here apply also to the other Spectrum emulators on the market.

First off is cassette tape. Most modern computers wouldn't even consider using cassette tape as a storage medium. Some do use tapes for back-up, but these tapes are a million miles from using a TDK C90. So, you have got an emulator and a stack of old Spectrum cassettes - how do you use the two together? Many machines have sound cards (electronics to generate sounds - similar to the AY chip in the Spectrum 128k, but generally more advanced) and these often have audio inputs, or inputs which can be used as such by the use of an adapter lead. It would be quite possible to play the cassette into one of these inputs, with the computer sampling (recording) what was being played and storing it as a file. This is a bit crude, but can be effective, but it does have the drawback that the sampled files can be rather big. There are various ways of doing this way, but generally a separate utility is used to read the data in. The file that is stored by this utility is then suitable to be read by the emulator.

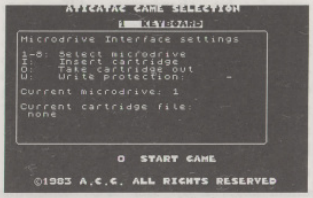
Another approach is to use one of the existing communication ports on the computer. Most machines have either a serial or parallel port; more often both. The parallel port is very suitable to read the tapes, as it uses voltage levels and pins most suitable to be converted for use with a cassette player. A simple electronic interface can be built/bought which will safely connect the two devices. With this method, the emulator itself can normally be used to actually load the program. Once the program is loaded, it may be stored as a snapshot file (a dump of the memory and registers) on disc. This method means less fuss, but it does put a lot more weight on the emulator. It must be able to deal with the loading signal at the correct speed and volume, without any loss of data. Z80 has two methods for this. The first is normal mode. This has been programmed into the emulator, so that when LOAD or SAVE are used, the emulator diverts from the Spectrum ROM routines, and instead uses special routines written for the PC. These will allow the reading and recording of standard Spectrum tape



format. It will not deal with any kind of non-standard loading routines such as Turbo load or Speedlock. It is very effective with older programs and ones you have saved yourself. The second mode is 'real' mode. To use this, the emulator must be running at approximately 100% (i.e. real Spectrum speed). This mode uses the real Spectrum ROM to load, and can load any type of format (such as those mentioned above). In true Spectrum style, however, it is very much more sensitive to tape speed, volume, emulator speed and emulator status (e.g. some games require that the R-register be emulated or they will not load). I have transferred all of my cassette programs from tape to the emulator using this mode.

While on the subject of serial/parallel ports, it should be mentioned that the serial port can be connected to the RS232 port of a Spectrum and data transferred that way. Generally, though, don't use the emulator for this. Use a proper terminal program to do the actual transfer as it tends to be more accurate and forgiving than the emulator.

Next, is microdrives. In theory, I guess it would be possible to hardwire a microdrive to a PC/Amiga, etc. I don't suggest it however. The best solution for microdrive programs is to copy them to tape and load them onto the emulator as above. However, some emulators do emulate microdrives. What this means is that once you have the program on the emulator, it will treat microdrive calls correctly. Z80 emulates microdrives at the IN/OUT level, so most programs (e.g. Tasword) should work fine. The emulator allows you define a virtual microdrive. This is actually a file of 137923 bytes long. It can be inserted into any one of up to 8 drives, and can be formatted, saved and loaded just as a real one. Of course, you still have to load the program from tape or disc.



Which brings us nicely to discs! Over the years, the Spectrum has had it's fair share of different disc formats - different sizes, densities and capacities. The most popular ones have been (in no particular order) Discovery, PLUS D, DISCiPLE and +3. Luckily, all of these standards used industry standards for the actual drive mechanism (unlike Atari 8-bits and early Apple Mac's). This means that most modern computers can physically read the discs, and so just need software to do it. Z80 provides emulation of PLUS D and DISCiPLE discs as an option. This allows 3½ inch and 5¼ inch discs to be used as PLUS D/DISCiPLE discs. You can format a PLUS D/DISCiPLE disc on a PC, but it cannot then be read by a real Spectrum, because of differences in the disc controller hardware. Otherwise, they should be compatible (i.e. a disc formatted on a real Spectrum will be read/written too by either a real machine or an emulator). The snapshots produced by the interface can also be read by the emulator. I don't know if anyone has emulated the Discovery disc drive, but I'm fairly sure that there are tools (for the PC at least) which allow such discs to be read if nothing else. If anyone has more information of this, please let me know so that I can include it in a later article. The +3 disc format has been emulated by an emulator called XZX. It can emulate the full +3 machine, but unfortunately this emulator is designed for use with the UNIX operating system, and so you need a machine capable of running UNIX and X11 graphics to use it. I have a copy of this at work, and it's very good - improving all the time in fact- but I have not tried to use the +3 emulation. The obvious problem with the +3 is that it uses 3 inch discs. If you have a 3 inch drive attached to the computer, then it should be possible to emulate a Spectrum's disc controller and use +3 discs. Otherwise, these must be converted to cassette or other disc type for transfer to the host machine.

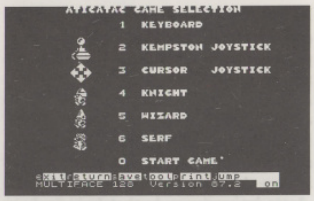
Another piece of Spectrum hardware which needs emulation is the joystick. As the mouse was still in it's infancy during the early days of the Speccy, the joystick was the main input device after the keyboard. As Sinclair didn't provide a proprietary joystick port for the machine, many third party manufacturers jumped to build expansion boxes for the computers expansion slot. This lead to a whole host of different methods of joystick input: Kempston, named after the company which first produced it, Cursor, which copied the cursor key inputs, Sinclair's own twin inputs on the interface 1 and other less popular types, including programmable. Each of these joystick interfaces can be emulated relatively easily on a host machine. The two most popular forms are to define a set of keys (normally the cursor keys) to act as the joystick directions, and to use the host machine's joystick port - the game port for a PC. Z80 emulates all of the three main standards, plus a user-definable joystick based on keystrokes. It uses both the PC cursor keys and the game port (if one is available). Here lies a problem. The Spectrum uses digital joysticks - that is to say that each direction is either on or off. The PC (and some other computers) can use analogue joysticks. These have varying degrees of switching, which give excellent control over flight sims and racing games, but not much when it comes to arcade games like the Spectrum has. To remedy this, either a digital joystick interface needs to be made (a fairly simple circuit for those with basic electronics knowledge) or (as I use) modern digital PC joysticks or, even better, joypads. These are the things that you get with games consoles, and the PC ones can be very good.

The mouse was mentioned previously. Z80 (I don't know about the other emulators) also emulates the AMS mouse as used in packages such as Art Studio. This should work just as on the real Spectrum. Just tell the emulator that the PC mouse should double as a Spectrum mouse, using a command line switch. Incidentally, it is also possible, with Z80, to use the PC mouse as a joystick. A different command line parameter for this. It's not possible to have the AMS interface and the mouse-joystick selected at the same time, however.

The next piece of hardware is the

printer. Again, the Spectrum didn't originally come with a printer port, and so the expansion slot was once again called upon to provide parallel and serial interfaces. The RS232 serial port used by the Sinclair interface 1 is emulated as part of the IF1 emulation, and simply redirects the output to a PC serial port, a PC parallel port or to a file on disc. If you have a real Spectrum with a null modem cable, data can be transferred directly between virtual Spectrum and the real machine. Most of the emulators provide some kind of printer output. Z80 is designed to be compatible with Epson and Laserjet standards, so most modern printers will be able to print using standard Spectrum channels and commands.

There have, of course, been lots of other add-ons to the Spectrum's hard done-by expansion port - light pens, light guns, speech synthesizers, etc. Perhaps the most useful, however, is the Multiface series produced by Romantic Robot. These interfaces operated as a backup and hacking utility. Pressing the red button on the top would cause the Spectrum to come to a stop, without crashing, and would allow snapshots to be saved to tape, and later, to disc. They also provide access to the memory, so POKEs could be added to programs without disabling the encryption of the game, and hackers could investigate and alter software easily. Z80 has licensed the Multiface technology to be incorporated into the emulator. By selecting the Multiface ON function, a simple NMI (F5) will have the same effect as the red button, freezing the virtual Spectrum and providing access to the Multiface features. I have used this to great effect. I actually managed to download a program from the PC to real



Spectrum by using the Multiface system on both. This was because it was a tricky program to copy and saving out from the emulator wasn't working properly. The Multiface worked first time. It is backwards compatible, so the emulator Multiface will work with all real MFs, but not the other way - +2a/+3 Multiface saved programs can't be uploaded to the emulated Spectrum.

The final piece of Spectrum hardware worth mentioning is sound. Sound doesn't NEED to be emulated, but most emulators at least provide 48k beeper sound, normally using the speaker on a PC (frighteningly similar!) Some also provide 128K AY sound chip emulation. The quality of this emulation depends on the hardware and software used. Z80 uses any Ad-lib compatible soundcard to produce the AY's 3 channel sound. The amount of screen usage can affect the quality of the emulation speed quite severely. It is generally pretty good, though. The particular emulation is very hardware dependant on the host sound hardware.

So, that is a lightning guide to the emulation of Spectrum peripherals.

If you have any questions, or information, you would like to see included in this column, then please feel free to send them to me, Pete Collier, 90, West Street, Burgess Hill, West Sussex. RH15 8PQ. or e-mail them to me on:-

etlprcr@etlxdmx.ericsson.se.

MISTAKEINYOURLISTING?

By:- Peter Bibby.

Don't spend hours looking for the faults in other people's listings - cast out the typing errors that bedevil yours....

On the face of it, typing in listings should be quite straightforward. You just type what's on the paper into the computer and there you are, one working program. This, however, is sometimes easier said than done. If you're not careful or are just plain unlucky, typing in listings can be an extremely frustrating experience for you and for anyone in the vicinity.

All programmers, if they're honest, will admit to having had the experience to typing something in and finding that it doesn't work. And no matter how hard they try, the fault is untraceable. If you haven't had this happen to you yet, touch wood, quickly. Or become more honest!

It's so annoying. You know that the syntax is correct, otherwise the line would never have got off the bottom line of the screen into the listing. Eventually you give up in disgust and say that the listing is wrong - usually in fairly strong language.

To be fair, though this can be the case, it very rarely is. Occasionally a part of a listing won't print out properly, or a space will appear where there wasn't one in the first place. It's even been known for part of a listing to 'fall off' a page. However this doesn't happen all that often - though once is one time too many for the poor, raw-fingered typist. The sad fact is that if the program won't work, you've almost certainly made an error typing the listing into your micro.

These may be harsh words but they're true. If you've typed in a listing and it doesn't work, the odds are that you haven't typed in the listing correctly. Accept the fact that you're not the world's greatest typist and start checking yet again. Of course, the best idea would be to stop the errors creeping in in the first place, but that's the counsel of perfection.

The first piece of advice to bear in mind when faced with a listing that doesn't work is don't get carried away. It's all too easy to become obsessed with a listing that's gone wrong, struggling with it for hour after hour, eventually losing your temper or even your sanity. If you don't spot the mistake in the first quarter of an hour then give up for a little while. Go and have a cup of coffee or something. See if the family still recognise you.

It's surprising how often the mistake becomes obvious when you return to the keyboard after a break. And if you still can't find the mistake, here's a selection of the ones I make all the time. Odds on you'll find the answer to your listing problem here. So for those of us who are less than perfect, here are five of the ways I've managed to make nonsense out of a correct listing.

In each case I will refer to the Spectrum, the machine I have and love. In most cases the same problems will

apply equally to the SAM, and indeed to most other computers as well.

Misscopying a listing

Believe it or not - and you probably won't after you've been struggling away for hours - the majority of problems are caused by misscopying a listing. One of the daftest mistakes you can make is to leave a complete line out. Of course the program won't work properly if it isn't all there, but lots of times we expect it to.

Sometimes the missing line will contain something vital so the program will grind to a halt and we'll be made aware of the problem. However, some lines, if left out, don't crash the program but leave it working - working badly. And if the line you've left out is only used once in a blue moon, that is, it's something like:-

```
IF bluemoon THEN do something
```

your program may go off the rails only when a blue moon appears. And that's really hard to figure out. Try leaving out a line from:-

```
10 LET cat=3
20 LET dog=3
30 LET both=cat+dog
40 PRINT both
```

and see the results. Notice that leaving out line 40 doesn't crash the program, but it does affect its results.

Often when we've left out a line, we've just skipped it by accident as we read the listing.

Another way of leaving one out is where, instead of typing in two lines, 20 and 30, we type in the first line correctly, numbered as line 20 and then number the next one, which should be 30, as 20. The second line overwrites the first and so we have a missing line as in:-

```
10 LET cat=3
20 LET both=cat+dog
40 PRINT both
```

To make it worse, the line numbered 20 is actually the one that should be numbered 30. It's amazing how difficult this can be to spot in a long listing, especially one where the line numbers are in an irregular order.

And the trouble is that the Spectrum can't tell you that 'line 30 is missing' because it doesn't know that it should be there. So any error message that it comes up with isn't all that helpful, often pointing to some other part of the program that depended on the missing line. If you try running the last program you get the message!

```
2 Variable not found, 20:1
```

It's obvious that the variable that's missing is dog, which should have been set up by the proper line 20. The program crashes, so you get an error message, but it won't tell you that there's a line missing. You have to realise that as you hunt back through the listing and find that there is no `LET dog` anywhere.

Then again you might assign a value wrongly. Suppose in the original program you typed in line 10 as:-

```
20 LET dog=2
```

In other words, there's a 2 where there should have been a 3. The program still works, but incorrectly. It gives you the wrong result. The error may be easy to spot in this example, but in a long program with lots of lines it's not so simple.

I've found that it makes life a lot easier if I enter a long listing in three or four sessions rather than one, saving it to tape/disc between times. Incidentally, I recommend that you SAVE your program every 20 or 30 lines. This is in case you lose your listings by an accident such as a power cut or a meddlesome younger brother. You might lose all your

hard work from the computer's memory but you will have the best part of it on tape or disc.

The moral is that when you're typing in listing, type in all of it. And type it in exactly. There's no point in changing the programmer's code and then feeling aggrieved when it doesn't work.

Yet people do this, correcting 'mistakes' that they find in listings and then wondering why the program grinds to a halt 20 lines later...

Misspelling

A close relative of misscopying a listing is misspelling. Watch your spelling because the Spectrum is very sensitive about such things. Misspell a variable and the micro can easily get confused, as can you when you try to sort it out! Suppose that you tried to get the cat and dog program running again, but made a mistake in line 40:-

```
10 LET cat=3
20 LET dog=3
30 LET both=cat+dog
40 PRINT bath
```

The micro works through the program, comes across 'bath' in line 40, can't find any reference to it in the variables area. Hence it crashes with the message:-

```
2 Variable not found, 40:1
```

In this case it's immediately apparent that there's been an error, but there can be times when the error is harder to spot. This is when a program uses variable names that are fairly similar such as TIM and TOM. If you hit O instead of I you end up with TOM instead of the intended TIM.

And there'll be no error message as the program already has a variable TOM.

Confusing letters

Confusing similar letters is a classic error that I'm sure everyone has made at one time or another. This is the error caused by mistaking a number for a letter and vice versa. Let's see the effect this can have on a program such as:-

```
10 LET LOOP=20
20 FOR l=10 TO LOOP
30 PRINT "A message"
40 NEXT l
```

which gives us 11 messages on screen. Probably the most common mistake, and the hardest to detect, is confusion between the numeral "0" and the letter "o" or "O". On poor quality listings these look very much the same, and even with clear listings it's all too easy to press one key in mistake for the other. Even with a slash across the Ø this can happen.

The Spectrum won't like it and the program will almost certainly grind to a halt. Suppose you made this mistake and line 20 became:-

```
20 FOR l=10 TO L00P
```

When you try to run the program it crashes with a:-

```
2 Variable not found, 20:1
```

The same kind of confusion can arise between the lower case letter L 'l' and the number '1'. They look fairly similar and on older typewriters they are often the same key, but not on the Spectrum. Confuse the two and you're asking for trouble, trouble that's very difficult to spot and sort out. Can you see why:-

```
20 FOR l=1O TO LOOP
```

brings the message:-

```
2 Variable not found, 20:1
```

when the program stops? Look at the character after the equals sign of line 20. Now it is true to say that *good* programmers don't use the lower case 'l' as a variable because of this problem, but not all listings - even those in ***FORMAT***, will be devoid of this poblem.

Another pair of look alikes to be wary of are the minus sign '-' and the underline '_' which are often confused. You can't do a subtraction with the underline sign, though it's amazing how many times you try!

Ghosts

A common pair of errors involve ghosts. The first is to introduce a "ghost" line into the program when you're typing it in. This happens when what was supposed to be:-

```
250 PRINT "Boo"
```

is entered as:-

```
25 PRINT "Boo"
```

It's all too easy to miss the fact that you've entered a line numbered 25 instead of 250. Now not only have you got a line in the wrong place, you've also got one missing. Two mistakes for the price of one! And if there happened to be a line 25 already, you've just overwritten it so there's a possibility of a three-way error.

So if you've typed in a listing and you notice a gap halfway through the line numbers that shouldn't be there, have a look for its clones and think about what they might have obliterated.

The second ghostly error is really stupid but, sadly, all too easy to make. It's done by forgetting that you're already haunted by a program in the Spectrum's memory. You then type in your listing and, if the line numbers of the two programs don't match, they get mixed up. The last line of:-

```
10 LET indians=8
20 LET cowboys=4
25 IF door=open THEN PRINT "En
   ter at your peril"
```

is obviously left over from an earlier program and shouldn't be there at all. The program won't know anything about 'door' and 'open' and so will come to an untimely end.

Wrong punctuation

Just as in ordinary writing, the dots and squiggles of punctuation matter to the Spectrum. In fact they matter even more, because although people reading your writing can allow for bad punctuation, your computer cannot. Unfortunately it's all too easy to confuse the fullstop '.', the semi-colon ';', the colon ':', and the comma ','. These may look very similar on listings and mistakes are easily made. This can cause all sorts of problems, from having displays in the wrong place or in the wrong colour to having the program crash without an error message.

One common mistake is to put commas in numbers. You may try to input 20,000 but the Spectrum won't like it if you type it in. The line will just sit there at the bottom of the screen, sullenly flashing a question mark at you. The micro requires the number in the form 20000 - that is, without the comma.

Another problem caused by mixed-up punctuation marks comes in data lists, where the items are, or should be, separated by commas. Even a simple program like:-

```
10 FOR L=1 TO 5
20 READ number
30 PRINT number,
40 NEXT L
50 DATA 3,3.5,4,4,5
```

can be devastated if the commas in the data line are not exactly right. The output from the program is:-

```
3     3.5
4     4
5
```

Suppose, however, what should be:-

```
50 DATA 3,3.5,4,4,5
```


is typed in as:-

```
50 DATA 3,3,5,4,4,5
```

The decimal point in 3.5 has become a comma. Now the output is:-

```
3     3
5     4
4
```

Five items are read from the six in the data list, but because of the inadvertent comma the data is wrong.

This will result in programs working strangely, if at all.

What's particularly annoying is that the Spectrum won't tell you that there is now one item left over in the list. It only displays an error message when it tries to read from a list with too few items, as you find out if you alter line 50 to:-

```
50 DATA 3,3.5,4.4,5
```

This results in:-

```
3     3.5
4.4   5
E out of DATA, 20:1
```

appearing on the screen.

These errors can be very tricky to sort out. If you get some weird happenings in a program it's always a good idea to check that the DATA lines are right.

And while we're on the subject of correct punctuation, see what happens if you use a semi-colon or apostrophe instead of the comma at the end of the print statement in line 30.

The moral is to be very careful with punctuation marks in listings. They may not mean a lot to you but they do to the micro. Get one wrong and it can be the devil of a job to find the mistake and remedy it.

Now you've found your mistakes....

One point to bear in mind is that when you do find a mistake in a line, don't think that it's the only one. If you made an error then your concentration was lacking at that point and there may be another one lurking about on the same line or thereabouts. It's amazing how often they come in pairs.

And beware of making another mistake when you 'correct' a line. It's very easy to introduce another error as you correct the first one.

All in all, it just comes down to looking carefully at what you're typing, both on the page and on the screen. If you spend all your time peering at the keyboard - as most beginner typists do - and don't look at the screen to check your work, mistakes will abound.

This seems obvious, yet it's very easy to become hypnotised by the keys, typing rapidly but not checking what you type.

So pay attention to what you're doing when you type in listings. A little time spend checking as you actually enter the lines saves a lot of time later.

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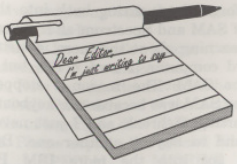

YOUR LETTERS

Dear Editor,

Regarding the SAM C program on page 24 of December's ***FORMAT***, may I make a couple of, I hope, helpful suggestions regarding the listing of SAM C programs.

The listing is a real horror! I carefully typed it into my computer and tried to compile, no way. I was met with a barrage of error messages. I then took the trouble to write the program out on an A4 sheet of paper. Counting up the opening curly brackets I got 12. My tally for closing curly brackets was 15!

Not being, as yet, very knowledgeable on SAM C, I proceeded no further with the program.

I then tried out Carol Brooksbank's program listed in the July issue, on the first run I was given the following error message,

"1-value required".

I investigated the program and found that the closing curly bracket above the line "if (count>10 =count<15)" was in the wrong place. The bracket needs to be after the printf statement.

"printf ("The number was %d", magic);"

I still got the error message as above. I changed the line to read, "if (count>9 && count<16)". This allowed the program to compile without any more error messages. I ran the program and it worked perfectly.

I wonder if other readers had problems with the program.

My suggestions for improving the listing of SAM C programs is:-

1. After each curly bracket put a line of dashes (or dots) across the column. e.g. (.....and .....) with the opening brackets on the left hand side of the page and the closing brackets on the right hand side of the page.

By separating the opening from the closing brackets in this way, it is easy to count up the number of opening and closing brackets. There should be the same number of each type.

The dotted lines would also clearly show the block construction of the program. Obviously when the program is typed into the computer, the dotted lines are ignored.

The second problem that crops up in listing C programs is that as lower case letters have to be used, the old problem of confusing letter 'l' with the figure '1' crops up. I found this problem highlighted in one of the text books on the C language. It was impossible to differentiate between the two characters.

I suggest that Format uses the continental way of printing the figure one and the figure seven should then be printed as with the slash, again in the continental way. If this format was adopted there would be no further confusion.

Best wishes to all at Format for 1996.

Yours sincerely, P.J.Williamson.

You lost me on the program front as I don't understand C that well. However, I'm sure people will soon point out any mis-prints if there are any.

As to the lower case L (l) and numeric one (1) these do look different in the typeface we use for listings 111111, the 1 (one) having the more slanted top stroke. Zero (0) and capital O are also distinguishable OOOOOO 'cos the zero is

taller and narrower. When I write something by hand I use the slashed seven, but I'm sorry to say that no typeface I have available will provide the feature. I'm also of the old programming school who would never dream of using lower case letters, except within quotes in print statements or in REM statements. Remember that C is very case sensitive, so **test** is different to **TEST** is different to **TeSt** is different to **tEsT** and so on. It is therefore very bad programming practice to have single letter variables in lower-case.

What I am looking to have soon is an automatic format routine that will take a SAM C program and reform each line so that is still of acceptable C syntax but will fit within the constraints of the standard column structure we use. Anyone care to offer a hand in writing just such a routine?

As to the curly brackets you mentioned, I count 13 of each in the listing. ***Ed.***

Dear Editor,

Years pass too quickly. It doesn't seem that long since the last renewal. I hope you and your team are all keeping well and are ready for Christmas.

Thank you for printing my letter in ***FORMAT***. The response was really great. The advice about the pokes to overcome the problem was spot on. Would you please give my thanks to the people who helped me through ***FORMAT***.

I can relax now that I know that Big, Brown envelope will be coming through my letter box once a month. That's when everything stops until I've read it from front to back and back again.

Keep up the good work. Best wishes to you for Christmas and the New Year.

Yours sincerely, E.Butterfield.

Dear Editor,

Please find enclosed my renewal from, I look forward to getting back into the world of SAM and Spectrum after a year away, learning about the more industry standard computer. I own a PC, but I miss the SAM. The reason I stopped using my SAM was because the keyboard was starting to break and I just never got round to buying another one. But instead got into the more IBM PC machines, because I repair them I found myself getting more involved and ended up getting one, but I find these computers have no excitement with them, not like when I first got my SAM. Anyway, I hope the SAM lives on for a long while and I am going to give my backing in whatever way possible.

As well as my subscription I would also like to order a new SAM Keyboard, I phoned the ***FORMAT*** office and you said you had a keyboard at £12.95, Please find enclosed to cover the full amount.

Yours sincerely, Colin Brown.

Hope your keyboard arrived in time to have your SAM up and running before Christmas. ***Ed.***

Dear Editor,

I would be grateful if you could furnish me with the address of a reputable repair workshop that will still repair Spectrums. If I could have them repaired I would happily continue my subscription to your excellent publication.

Yours sincerely, R.Barnard.

Spectrum repairers are becoming difficult to find these days. Anyone out there any recent experience? Drop us a line and we will pass on your recommendations direct to Mr Barnard, and through these pages to other readers. ***Ed.***

Dear Editor,

I would like to thank you for your very friendly service and for the very interesting magazine.

I will try to send an article to you when

I have caught up with the things already discussed so far.

Maybe I could ask two questions to be answered via the magazine...

1. How to activate drive 1 when doing a LOAD Pn if drive 2 is the active drive without having to do a CAT 1 command?

2. Please explain the special File types eg. SPECIAL, M/DRIVE and OPENTYPE, as these are not explained in the DATEL manual.

Yours sincerely, M.Hayward.

OPENTYPE files have been dealt with many times in ***FORMAT*** so you should be able to pick up all you need to know from back issues. M(icro)DRIVE files are only created by programs using Interface One Hook Codes and Special files can be anything the programmer wants them to be, they are just a label to use if the programmer does not want other programs to have easy access to them.

LOAD Pn was not really designed to be used within a program but if you want to, then the way to switch drives is to use a dummy LOAD @ command. In theory there should be a POKE @ to switch drives but I can't find it at the moment - anyone out there with an answer? ***Ed.***

Dear Editor,

I understand that in the December issue of ***FORMAT*** you ran the 'Name that Computer' quiz that I sent in (quite some time ago now).

I didn't think you were interested in it, and as I wrote the questions so long ago, I have lost the answers and cannot remember them.

Short pause.....
Long pause.....
Gasp.....
Sorry about that.

Some silly, some easy, and some not so easy.

1. SPECTRUM
2. BBC
3. ZX81
4. ARCAMEADIES (?)
5. SAM
6. COMMODORE
7. AMIGA (AM EGA)
8. ORIC
9. DELL
10. MACINTOSH
11. AMSTRAD
12. SHARP
13. SINCLAIR (SIN 'C'LAIR)
14. APPLE
15. APRICOT (APR 'L'COT)
16. ATARI (A (RAT)I)
17. QL (Quite Likely)
18. I.B.M. (It Beats Most)
19. JUPITER ACE
20. MSX
21. EINESTINE (From the film Back To The Future)

Yours sincerely, Derek Morgan.

Thanks Derek, there were several Jenny and I could not get. Hope readers enjoyed it. ***Ed.***

Dear Editor,

As you can see, I have rejoined your magazine again as I now own a SAM Coupé.

Can you help me. I would be interested in putting in a disc drive into the computer as I do not possess one. I would like to know where to get one. Also the price, as I would like to take up your offers etc but not sure if all these are on tape or disc.

Also I would like to run my old Spectrum tapes on the SAM Coupé, is there any way I could do this.

Yours sincerely, P.Whale.

Disc drives are now easier to fit with the new style kit from West Coast (see my review in the issue). If your SAM is old enough not to have a drive fitted then check the ROM version number by typing PRINT PEEK 15. If the result is 30 or above then all you need is a DOS disc (£5.95 from us including postage) and away you go. If the number is lower, then you need a ROM upgrade kit (which

includes an updated DOS) which costs £12.95, again available direct from us.

The DOS disc includes the latest version of the MGT/SAMCO Spectrum Emulator but it is also worth looking at one of the commercial versions available from other companies. ***Ed.***

Dear Editor,

I have been using the D.T.P for quite a number of years (originally started on a 48K Speccy+ and composed on a SAM 512k now for at least 5 years) for an "IN HOUSE" paper. (Described as scurrilous) (Its not that bad) at my place of work. I would like to know if any 'Clip Art' other than P.C.G's discs 1,2 and 3 exist for the D.T.P. and where can it be bought. I also note that the original discs are not advertised in ***FORMAT*** for sale with the D.T.P. pack. Is this because you do not have copies or indeed the copyright to sell them. If you have the copyright but not the discs I would gladly lend my originals to be copied.

I enjoy all articles in ***FORMAT*** even though I am not a Programmer but a user. I think you cover most and cannot suggest articles for future issues. I generally do not play games on the SAM (My children do) but use The Secretary, Campion, D.T.P and SamPrint regularly.

I still, after all the times you have explained the secret of the membership number, get confused. So have my own solution which is to cut out the label from the envelope that ***FORMAT*** comes in and stick it on this document.

I hope all are well and have a good Christmas.

Yours sincerely, R.M.Wyard.

There is a lot of Clip Art floating around in the PD scene most of which can be used with the PCG DTP package. The only reason we do not advertise the Clip Art discs on the FRS page is because of lack of room. They are available at £4.95 per disc (state disc 1,2 or 3) or £11.95 for all three, and can be used with the PCG DTP or with most art packages on Spectrum or SAM. ***Ed.***

Dear Editor,

I've just obtained a second hand drive to add to my SAM Coupé, turning it into a two drive system. However, the second drive does not always work. If I put it in as drive 1 then it is OK, but if it is put in as drive 2, or if I put my original drive in as drive 2, then MasterDOS does not always recognize it and I get an error message if I try to access drive 2.

Is my SAM faulty?

Your sincerely, S.R.Millson.

Doubt it Mr Millson, MasterDOS checks there is a drive controller for the second drive each time it loads and sometimes it gets screwed and gives the wrong answer. I'm not sure why this is, but I bet if anyone out there has an answer we will hear about it soon. SAMDOS does not do the test automatically, it relies on the Basic in the menu program loaded if you use the master disc.

Anyway, in the meantime, if you always have two drives then just do a POKE DVAR 2,208 to make sure MasterDOS will access the drive. This could be done as part of an auto-load program on your Boot disc. ***Ed.***

Letters may be shortened or edited to fit on these pages although we try to edit as little as possible.

This is YOUR letters page so it is up to you to fill it with interesting things. Come on, get writing, any subject even remotely related to computers. Just keep things as short as you can so we can fit in as many as possible each month. Please write clearly or type your letters. Send them to the address on page 3 or fax them to us on 01452 380890.

THANK YOU

Jenny and I would like to use this small space to thank everyone who sent us a Christmas card or fax. The were very much appreciated - and they did save me money as I did not need to buy decorations for the office (only kidding). Happy New Year. *Bob & Jen*

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We are sorry to say that the range of binders we have been selling for a number years has now been discontinued.

We are urgently attempting to source a new binder and will bring you news of it as soon as we can. In the meantime, if any reader has a source for a suitable A5 binder we would love to hear from you.

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