

**Volume II No 4**  
**(Issue 14 July/Aug '83)**



I'm sorry but for one month you will have to do without an Editorial. Its over 90°F outside at the moment and impossible to think. If it ever cools down to below 80 I'll try to write something for next month . . .

Paul Barbour

## news

### Bang!

If the Editorial isn't enough my computer is overheating even with the fan set to high so you'll all have to make do with a shorter news section.

### Show II

The second show of the year that we will be attending is the Acorn User exhibition next month. It is open between the 25th-28th August 10am-7pm (except Sunday 10-4) and is at the Cunard International Hotel. This is within five minutes reach of the M4 (depending on traffic!). Nearby Hammersmith Underground Station is served by the Metropolitan, Piccadily and District lines. There is a large London Transport bus terminal alongside the Hotel which serves all BR Terminals. LASERBUG will be at stand 26 opposite Leasalink. Other people due to attend the show are Acacia Computers, Acorn Computers, Advanced Memory Systems, Addison Wesley Publishers, Ahkter Instruments, Ameeco Hydrospace, A.S.K., BBC Publications, Beebug, C.J.E., Computer Bookshop, Computer Concepts, Computer Marketplace, Cumana, C/WP, Economatics, Electronequip, Eltec, Gemini Software, Golem, Intastor-Pressboard, Kansas City Systems, K.S. J., Leasalink, Microvitec, Microwriter, Micro Age Electronics, Micro Aid, Micro Management, Micro Ware, National Extension College, National Micro Centre, Opus Supplies, Portatel Conversions, Prentice Hall, Program Power, RH Electronics, Silent Computers, Sir Computers, Software for All, 3D Computers, U-Microcomputers, Viglen and Watford Electronics. We have just heard that although the Electron will be on display, it will not be on sale.

### LASERBUG expands

As soon as we can lay our hands on one, LASERBUG will be expanding to cover the Acorn Electron as well. This is likely to be from the September magazine onwards. This does not mean we'll be letting our BBC readers down as the size of LASERBUG will probably increase to cover all the extra information.

### Electron Backup

It seems that when the Electron is launched it will have better support than the launch of the BBC ever had (even though the BBC wasn't launched as such, it was just that people who had been waiting 7 months got their computer through the post!). Acornsoft will have 12 tapes out - GAMES: Chess, Draughts & Reversi, Meteors, Monsters, Snapper, Starship Command. LANGUAGES: Forth and Lisp. GRAPHICS: Creative Graphics and Graphs & Charts. EDUCATIONAL: Tree of Knowledge. MISCELLANEOUS: Personal Money Management. Addison-Wesley are bringing out two Electron books - Start Programming With the Electron (Which will be given free to anyone buying an Electron) and The Electron Book. the former will cost £6.95 and the latter £7.95. A tape will also be available with all the programs from the Electron Book. MORE DETAILS: Acornsoft Ltd., 4a Market Hill, Cambridge, CB2 3NJ/Addison-Wesley publishers, 53 Bedford Square, London, WC1B 3DZ.

### He Who Laughs Last

The Americans might be getting a super BBC Micro with VIEW, DFS, speech, etc. but who cares? It seems because of the difference in broadcasting systems, all the screen modes will be completely different. For instance, MODE7 will be 40x20 instead of 40x25 thus meaning that the Beeb could not be used for any kind of teletext service. MODE0 becomes only 80x25 instead of 80x32 and MODE3 normally 80x25 will be 80x22. This also means that ALL software written on the English Beeb will have to be re-written for the American one.

### Manual Hobbit

Our review of the Hobbit last month criticised the poor preliminary manual. Well, Ikon have produced a new 46 page manual which answers all of the points brought up in the review. Also, Ikon are going to change the colour of the Hobbit so it matches the computer. MORE DETAILS: Ikon Computer Products, Kiln Lane, Laugharne, Carmarthen, Dyfed.

### Write Your Own Defender

Acornsoft are apparently going to bring out a book later this year giving you all kinds of hints and tips about writing arcade games. The book will be written by authors of the best selling Acornsoft arcade games. So if you want to make your fortune buy the book and write your own Zaxon . . .

### Updated Micronet

Micronet are planning to completely update their package for the BBC Micro. Instead of an acoustic modem(i.e. the phone plugs into a special box) Micronet will be using a direct connect modem (which means the box plugs into a special socket which is fitted by BT free of charge). Also, instead of the normal cassette or disk based terminal software, a ROM version is to be produced which will have the additional facility to write messages off-line and then up load them later. Both products are due to be released on 1st August and we should be reviewing both in future issue of LASERBUG (won't we Robin?)

### ROM Based Spreadsheet

Although Psions VU-CALC is meant to be coming out on ROM no signs have been seen of it yet. However, Computer Concepts have just released Beencalc. It will cost £34.00 + £1 P&P + VAT. We might be reviewing this in a future issue (although CC never sent us a review copy of WORDWISE so why should they send us a review copy of Beebcalc?). MORE DETAILS: Computer Concepts, 16 Wayside, Chipperfield, Hertfordshire, WD4 9JJ.

### Chalk It Up On The Wall

A whole pile of press release here all to do with Chalksoft. Chalksoft have moved (that's newsworthy?) - new address at the end of this feature. Chalksoft have now appointed Ward Lock Educational as their sole school's distributor. This combination of Ward Lock and "Britain's leading independent supplier of educational software" should hopefully prove fruitful for both companies. Chalksoft also now have four new programs for the Beeb. Eiffel Tower is designed to test the knowledge of French

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vocabulary, correct answers adding a part to the tower. Note Invaders is all about reading music. Pirate is a children's adventure game. StoryA - Spanish Gold is a new kind of story book on the computer where you can choose what happens next. The stories are illustrated too! The Programs cost £9.25 apart from Story which is £7.95

#### Z80 Software

Acorn and the American software house Chang have made an agreement over software for the new Z80 second processor. Full details will be released with the processor but it is thought to be a complete business software package.

#### We Don't Care

If members of LASERBUG don't renew their subscriptions we aren't going to mind. LASERBUG will now be available in selected computer shops up and down the country (and around the world!). If your local shop doesn't start stocking LASERBUG ask them to get in touch with us for details of our dealer scheme. We are also looking for overseas distributors. Any company interested in stocking LASERBUG should write to us direct at the normal address.

#### Cube And The Beeb

Control Universal have just brought out Beebex, an interface card to link the BBC's 1MHz bus to the Eurocards. The basic unit costs £49 and will allow four of either Cubes own or Acorn cards. With a larger system you could connect up 1 mega byte of memory to your BBC Computer !!! MORE DETAILS: Control Universal Ltd., Unit 2, Andersons Court, Newnham Road, Cambridge, CB3 9EZ.

#### High Speed Telesoftware

The BBC is seeking permission from the Home Office to extend its teletext service from four lines to six. This means that Ceefax will have a 50% speed improvement which in turn means that telesoftware will load in that much faster (should anyone ever receive a teletext adaptor).

#### Eventually

Eventually Micronet did manage to send everyone a new manual for the new version of the teletext terminal program. About time too!

#### Electron On Sale???

The Electron might be on sale at the Acorn User Exhibition. On the other hand it might not. In a press release Chris Curry said "... We're concentrating on a really powerful display of our products, including the new Electron, which people can then buy from the dealers on other stands". We spoke to one of the larger Acorn dealers who told us that he had 5000 Electrons on order and all of them were spoken for. The earliest he could see having one actually on sale in his shop as such was Easter! Somebody from Acorn said that Acorn would only have a prototype at the show and none would be on sale. Another dealer said that he did not expect to start receiving supplies till Christmas time. What is going on? Anyway, more details on the Electron. On average, the Electron is 34% slower than the Beeb. It has its operating system and BASIC all in one 32k chip. There is no 300 baud tape (hopefully the 1200 baud one will be good enough) and only one sound channel can sound at one time.

#### Speech Chip Is Here

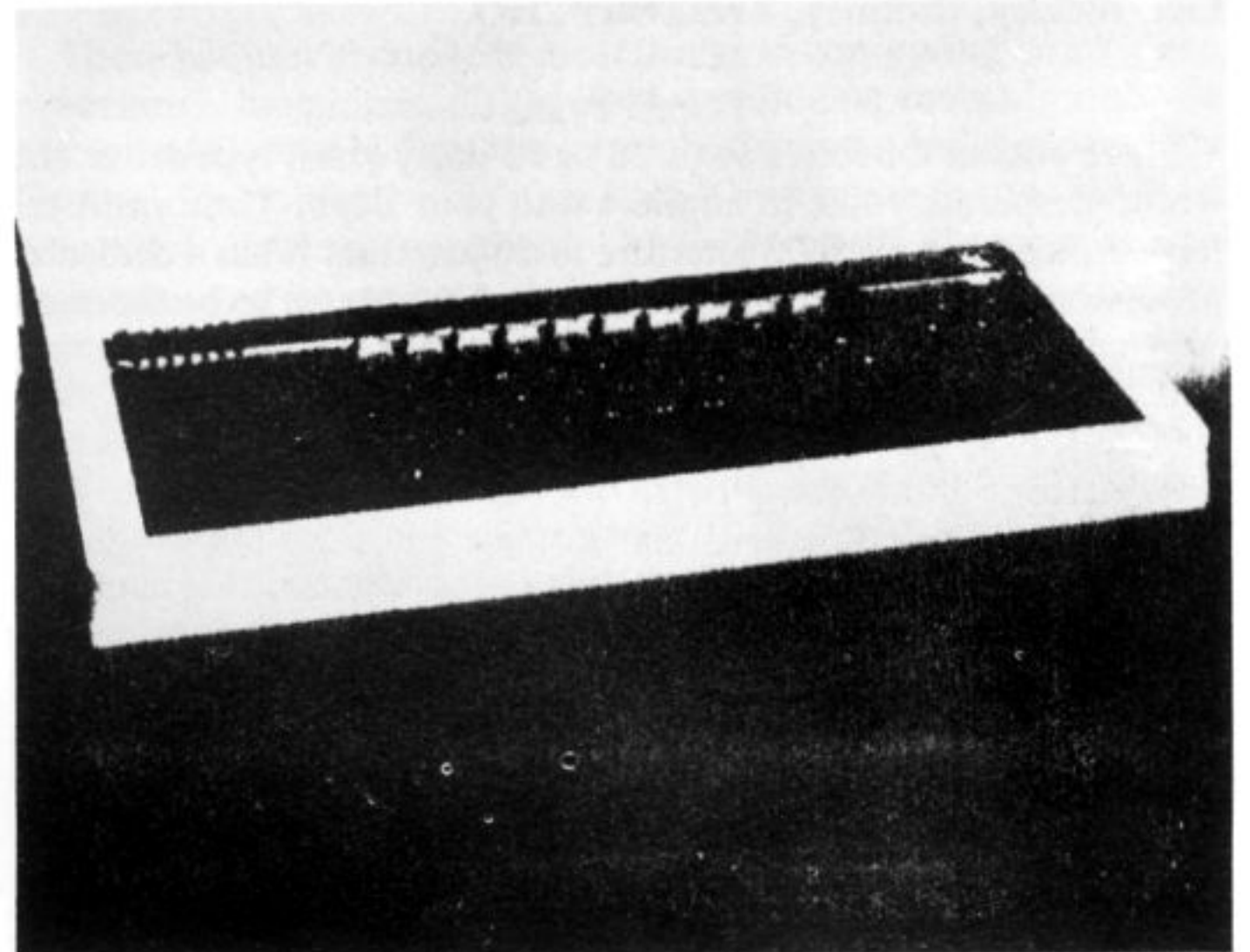
The speech system upgrade for the Beeb should be available now from your local Acorn dealer. For a full review see elsewhere in this magazine.

#### Is It A Joystick

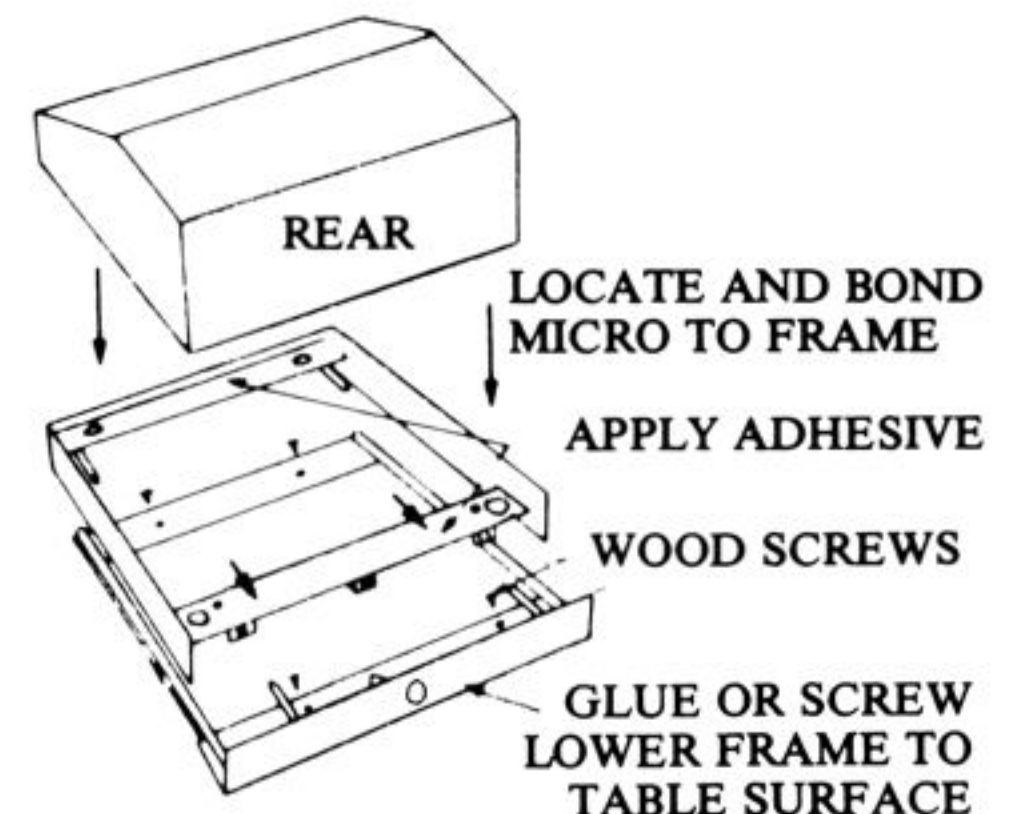
Voltmace Ltd. have just produced some new joysticks for use with the Beeb. Well, calling them joysticks isn't really fair. They do have a joystick, but as well have a keypad built in. At their simplest, the joystick works as usual and the computer can identify between the rows of keys on the pad. With the more complex system which connects to the user port as well as the ADC, each individual key can be detected. Even two handsets can be connected at once. A

special program is supplied with the handsets to enable you to use the handsets with games such as Acornsoft. This means that you can define the joystick for movement and use one button on the keypad for normal fire, one for smart bomb, one for hyperspace, etc. We would print a photograph but Voltmace neglected to send us one. we might (what about it Voltmace) review them in a future magazine. MORE DETAILS: Voltmace, Park Drive, Baldock, Herts., SG7 6EW

#### Secure Your Micro



Selmor Engineering Industries have designed a simple but effective security device for the Beeb which is now being made under licence for BBC Enterprises. "An upper frame is bonded to the BBC Micro which then locks into the lower frame which has been fixed to the work surface."



A complete set costs £26 + VAT or just the lower frame is £18 + VAT. A version for disk drives and monitors is being developed. Selmor make a range of computer furniture, one configuration of which has been selected as suitable for the BBC Micro. Vector Marketing are handling sales but more details are obtainable from Selmor (Engineering) Industries Ltd., 24 Mulberry Street, Tower Hamlets, London, E1 1EH.

#### Salamander Drop

Salamander Software have dropped the price of the EDG Graphics Package. The tape based version is reduced from £24.95 to £19.95 and the disk version from £29.95 to £24.95. £11.50 and the return of the EDG tape version will get you a disk version. The disk version does include a utility to convert tape based picture files to disk based files. We did review EDG a few magazines ago and it did quite well. MORE DETAILS: Salamander Software, 17 Norfolk Road, Brighton, East Sussex, BN1 4AA.

#### Acacia RAM

£149.90 will get you a little box to sit next to your computer and a chip to plug in. Once you've plugged the box into the 1MHz bus and the chip into a ROM socket you will find that you have all sorts

of goodies like 4k RAM that you can access and when you switch the computer off the RAM will still hold its contents. You will have a full electronic diary that will function whenever the computer is on no matter what you are doing (so if while you're scoring 10 million on Planetoid and a buzzer sounds reminding you of a dental appointment . . .), you will have a filing system which will allow you to save programs, function key strings, etc. with things like wild card filename search, file manipulation, file dating, automatic compact, etc. You will find you have a box that can be expanded considerably. If all this sounds interesting contact Acacia Computers, 5 Coombe Lea, Bickley, Bromley, Kent, BR1 2HQ.

#### Praxis Pranks

Have you an Olivetti Praxis 30 or 35 daisywheel typewriter and would desperately like to connect it to your Beeb. Timtom Micro have brought out a RS423 interface to do just that. It has a dedicated processor allowing the complete Praxis character set to be accessed.



The small box just plugs straight into the typewriter and does not effect its normal operation. It costs £69. (If anybody knows how to connect up a Silver Reed EX-55 to Beeb please let us know). MORE DETAILS: Timtom Micro, 9 Ilton Road, Penylan, Cardiff, CF2 5DU.

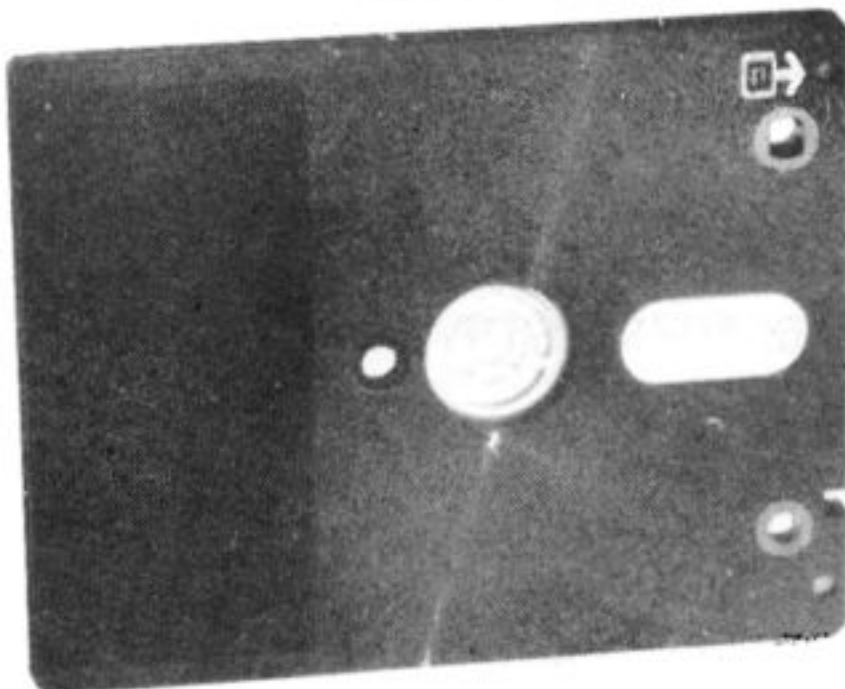
#### Perfect Touch

In future when BBC Micro owners upgrade to the Torch Z80 disk pack, they will also get a software package written by Perfect Software (an American company) consisting of a word processor, spelling checker, database and spreadsheet program. MORE DETAILS: Torch Computers Ltd., Abberley House, Great Shelford, Cambridge, CB2 5LQ.

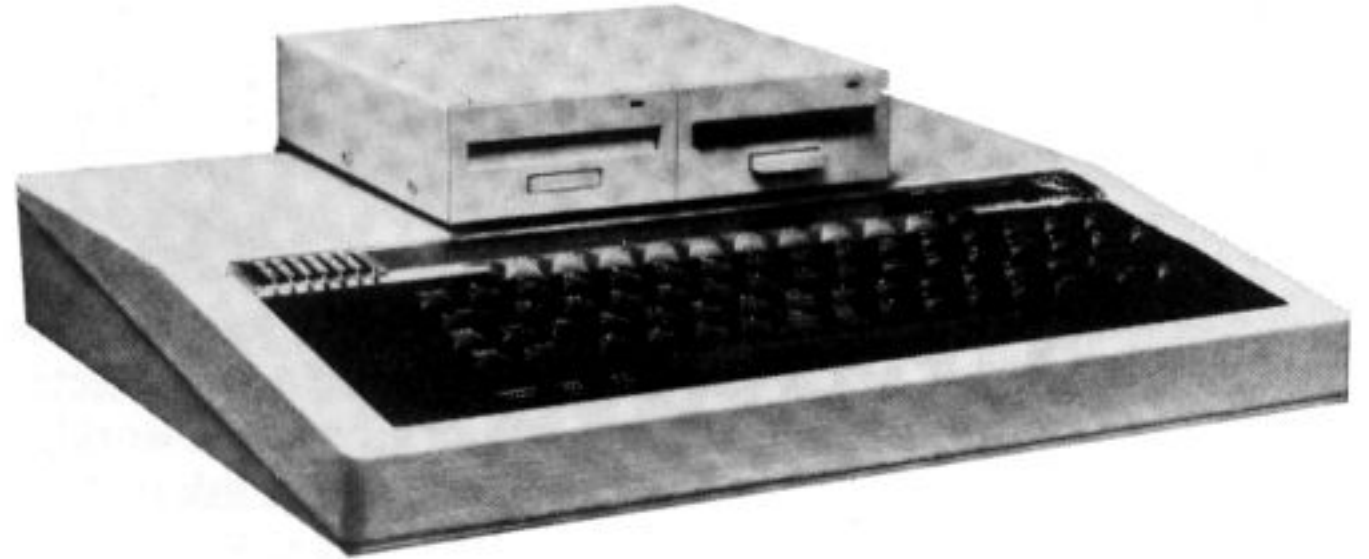
#### Quick Tree

Quicksilva Ltd. who produce a couple of programs for the BBC Micro (but mainly for the ZX Spectrum) have set up another branch (Quick Tree, branch-joke?) in America! This makes them the first British Software house to establish a North American operation (in Texas actually). There's no more to the story(?) so I might as well give you Quicksilvas address (the UK one, we haven't that many members in the States yet) Quicksilva Ltd., Palmerston Park House, 13 Palmerston Road, Southampton, Hampshire, SO1 1LL.

#### What?



What is this I hear you ask? It is a 3" disk (it isn't floppy but in actual fact very rigid!). These miniature disks give 100k storage each side. When you have filled up one side you simply eject the disk and turn it over! A light on the drive will tell you what side you are using. A disk interface is required but once fitted you can have single 100k drive for £225 and a dual 200k drive for £399.



A utilities disk is supplied but is also available on EPROM (the EPROM is also suitable for normal 5" disks). Gemini and Bourne Educational Software will both be offering their programs on these compact disks. MORE DETAILS: Advanced Memory Systems Ltd., Green Lane, Appleton, Warrington, Cheshire, WA4 5NG.

#### Acorn Back Everyone!

## In the midst of battle, a moment of harmony.

Whatever the differences between the three major parties (and we're mindful that elections are fought and won on differences), we're happy to report a certain amount of accord on, at least, one important issue.

All three parties have recently\* reaffirmed their commitment to the continuing growth of information technology and to the vital role of the microcomputer in education and industry.

Whoever wins tomorrow, therefore, it is certain that the microcomputer has an increasing role to play.

Now this is not only good news for those of us within this exciting growth industry.

It is also good for Britain—for this is one industry where we lead the world.

Acorn Computers is one of the handful of companies that has helped Britain achieve this position.

We are the designers and manufacturers of what is acknowledged to be the best micro in the UK—the BBC Micro, a

machine which is just beginning to enter world markets having already established itself at home. Its most significant contribution has been in education and today the BBC Micro is in 80% of all British

schools that have micros.

Britain is already a world leader in the use of computers in education. Now we have the vehicle to establish our educational software as the finest there is too. (As indeed it is: it has long been observed

that computer software brings out the inventive best in the British.)

High technology is basic to the future growth and prosperity of this country.

The microcomputer industry is a vital part of that technology. Isn't it reassuring to know that, whoever is drinking the champagne on Friday, there is a shared determination to keep that industry ahead in the world?

Acorn Computers Limited, Fulbourn Road, Cherry Hinton, Cambridge CB3 4JL  
Tel: 0223 245200. Telex: 827975 ACORN G.

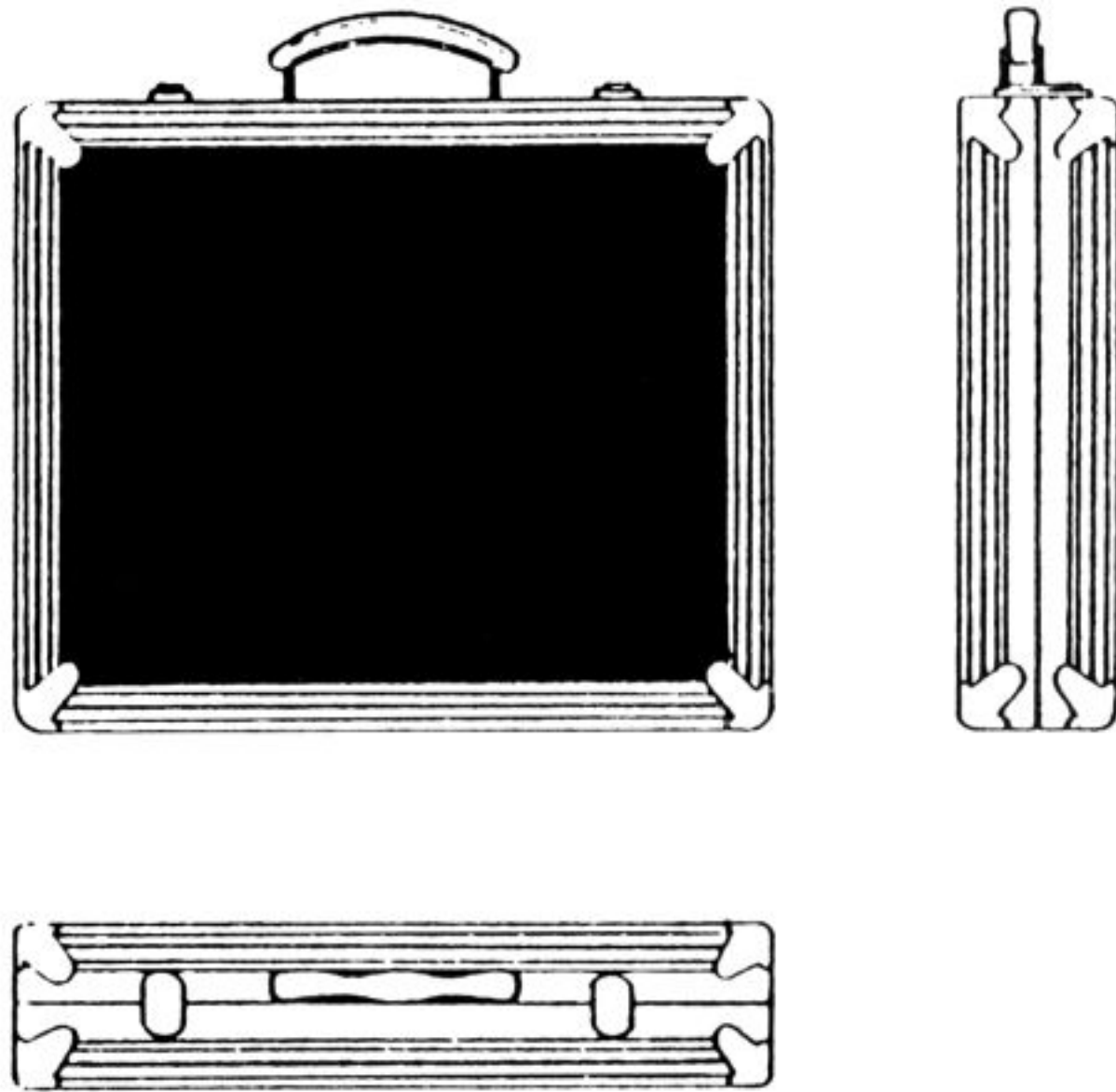


The day before the recent General Election, Acorn took out an advert in all the major newspapers.

This basically said that no matter what the difference the main political parties had, the one thing they all agreed on was the continuing growth of "information technology".

#### Carry On Beeb

Here is the most secure way to protect your micro. Comp-U-Case produce a hardwood ply case coated with high impact plastic and having aluminium side and corner protectors. It has a leather handle, foam interior and a compartment for cables, etc. It measure 450 x 530 x 115mm and weighs 5kg.



It costs £64.99 (!) although LASERBUG members get a 5% discount. MORE DETAILS: Comp-U-Case, 243 Munster Road, Fulham, SW6.

**Alternative Speech**

So you don't want the Acorn Speech System because it uses set words and not phonetics. What will you do. Buy Smartmouth of course !!! The Smartmouth uses virtually no memory-just 4-B bytes a word. Any word in English can be made up from a combination 64 allophones-all of the allophones are stored in this system and so you can say any word at all! Full instructions are given as well as many examples of words. It plugs straight into the user port and comes with its own speaker, aux. output, full software and a one year warranty. The unit requires no soldering or extra chips and cost just £37 + £2 P&P + VAT. MORE DETAILS: Technomatic Ltd., 17 Burnley Road, London, NW10 1ED.

**Spot The Difference**



What is the difference between these two pictures? One is the ordinary letter heading of Image, the other is a dump of the Image logo using an Epson printer. The computer version wasn't done with a graphics package but instead utilises something much more versatile - the Image Copier. How much does pre-printed continuous stationery cost? Far too much for most people. However, doesn't your company logo look much better at the top of a page than just some double width words. Using the Image Copier, a copy of your normal logo can be put straight into the computer. This is done by placing the artwork in the copier and a direct transfer is made onto the screen in any graphics mode by using a scanning infra-red sensor that interfaces direct into the Beeb. the relevant part of the screen can then be digitised into information suitable for a screendump routine for use with various printers. At the moment the Image Copier is capable of dealing with artwork,

no matter how complex (within reason and providing a program ready for use with Epson printer. Image will be offering a digitising service for good quality artwork for around £25 (MODE4 - artwork 1.8 inches by 8 inches maximum). As a special offer to LASERBUG members and while the prototype system is being finalised Image will offer an introductory service for £20 as long as you quote your membership number in all correspondence. MORE DETAILS: Image, 57 Orchard Way, London Road, Ashford, Middx.

**MIUG**

There are user groups for most things in computing-computers, processors, languages, disks (more details next month!) and now Micronet! George H Foot has set up the Micronet Independent User Group. The objective of the User Group are (a) to facilitate discussion between members, (b) to ascertain the opinions of members and to present their collective views, (c) to simplify communication between members having the same interests, (d) to provide mutual assistance as a result of the exchange of information and experience between members, (e) to promote the interconnection of personal computers and of networking and (f) to foster a community spirit between members. The copy for the first issue of the users group magazine has been sent to Micronet and should have appeared on the 19th July (did it?). Features are to be updated every week but pages on news and interchange between members every day possibly - "we do not yet have the administration to do this". The MIUG sounds a very interesting thing - it is indexed for the main Micronet menu so you can get to it from there. best of luck George! and don't forget to watch page 8008128 after 1st August, will you . .

**So What**

So what about the 90°F + heat, we still managed to write the usual length of news stories (and had less then 5k of memory left with VIEW in MODE7).

**arcade game high scores**

Where would we be without Ian Cook? Is it fair that he alone should be given the near impossible task of beating the official Acornsoft high scores??? Come on all you arcade game fanatics out there, help Ian by trying to beat some of Acornsofts (and Ian's!)

Scores . . .		
Arcadians(1)	35,000	Neil Raine
Atlantis(2)	39,650	Andrew Graham
The Frog(3)	22,380	Ian Cook
Galactic Firebird	10,400	Ian Coldicott
Missile Base(1)	50,000	Jonathen Griffiths
Meteors(1)	44,000	Neil Raine
Monster(1)	134,040	Ian Cook
Planetoid(1)	40,800	Neil Raine
Rocket Raid(1)	135,000	Nick Pelling
Snapper(1)	262,810	Ian Cook
Starship Command(1)	2,152	Johnathen Griffiths
Super Invaders(1)	46,300	David Featley

KEY : 1 Acornsoft  
 2 IJK Software  
 3 Computers for All  
 4 Kansas

If you have a high score that beats any of the above games or have achieved a good score on any arcade type game not mentioned above please send them into us giving full details including a signature of a witness or some proof of the score

# THE Computer Fair

Personal computers  
Home computing  
Small business systems

The Computer Fair was held at Earl's Court, London between the 16th and 19th June. 47,000 people attended the exhibition, 9,000 more than last year. There was national coverage of the event on BBC TV, articles in The Times and Sunday Times and both Thames and LWT had cameras at the scene.

How did the fair really go? Well, the best way to describe the whole event was as one huge arcade. The most prominent feature was all the different games with large stands by Dragon Data, Microdeal, Sinclair, Imagine, Atari and Texas to name but a few. Although there was a large number of people in attendance, most of the visitors came to look, not to buy perhaps indicating that the public is becoming more discerning?

LASERBUG was there of course, at stand C8 in Club Avenue:



From left to right: Maureen, Mark and Paul Barbour. All posters, magazine stands, etc designed and made by J E Driscoll. (Photograph by Cernis McHugh Photographic Co Ltd.)

We had a full BBC Micro system set up but the thing that was attracting the most attention was our screen dumps! Paul was on hand to answer everybody's questions which ranged from "What does a computer do?" to "Can I interface the Beeb to a mainframe?"!!! We manage to have the June issue out at the show and also available was the first of the reprints of issue 1. Our great new Software Search competition (have you entered yet?) was also launched. But what else was there? Unfortunately not a lot! Going one by one through the BBC Micro stands:

**Acorn Computers**, 4a Market Hill, Cambridge, CB2 3NJ — Nothing particularly interesting here — all the good items are being saved for the Acorn User show. Two pretty inactive second processors were on show (interesting fact — the demonstration software for the second processors do not actually need the second processors to work?). A single teletext adaptor was on show spending its time just quickly flicking through pages on Ceefax. The one interesting thing was the new Videodisc system enabling a Video Disc to be controlled by the BBC Micro.

**Addison-Wesley Publishers**, 53 Bedford Square, London, WC1B 3DZ — The publishers of Acorn User had little but books on sale at the show, some of these however were about the Beeb.

**A & F Software**, 830 Hyde Road, Gorton, Manchester, M18 7JD — A & F produce 7 programs for the BBC — Painter (which is great!) Planes, Frogger, Pharaoh's Tomb, Shrinking Professor, Horror Castle and Bouncer. Programs were available on both tape and disc and cost £8 or £11.50 respectively.

**Beebug**—who?

**Bug-Byte**, Mulberry House, Canning Place, Liverpool 1 — At the show we were told that Bug-Byte was giving free software to people who came up complaining about the non-appearance of the Beebon. Apart from that the usual Bug-Byte software range was on display.

**CJE Microcomputers**, 25 Henry Avenue, Rustington, West Sussex — In an extremely cramped stand, CJE was selling a range of BBC Software and leads. However the main items on display were the Star range of printers. For model A owners a memory and 6522 upgrade was available for £23 and a full upgrade for £55.

**Communicar**, 70 Salisbury Road, London, NW6 — I mention this company for no other reason than the fact that their stand consisted of one car in the centre of the stand. The car had, you guessed it, a BBC Micro sitting in the back working quite happily. That's a good idea for those long journeys . . .

**The Counting House**, 123 Green End Road, Hemel Hempstead, HP1 1RT — You'll never believe what this company had on sale, coloured floppy disks!!!

**C-Tech Software**, 184 Market Street, Hyde, Cheshire — C-Tech, better known for ZX games (if you know anyone with a Spectrum make sure they don't buy C-Tech Frogger, its dreadful!) were selling the usual range of BBC software, disk drives and printers.

**CW/P**, 108 Rochester Row, London, SW1P 1JP — CW/P had a few disk drives and monitors for the Beeb as well as a good number of printers. However what I did find interesting was a four colour printer plotter for around £600 — it was a full size printer and looked quite interesting. However when I tried to ask one of the people on the stand about it I got one quick word and he dashed off to find something more interesting to do — if you can't be bothered to talk to customers CW/P I suggest you pack it all in.

**Database Publications**, 68 Chester Street, Hazel Grove, Stockport, Cheshire, SK7 5NY — The publishers of the Beebon/BBC Micro User/The Micro User/Next Name Change. Until they decide to talk to us I'm not going to write about them again, so there!

**Disking International**, Liphook, Hampshire, GU30 7EJ — They don't produce anything for the BBC as such but do sell all kinds of floppy disks at very good prices. As they managed to get me some blank disks and as I hounded them for the disks when they were late arriving one day I thought I should just give them a mention — thank you.

**Electronequip**, 36 West Street, Fareham, Hampshire — I must have spent more of my money on this stand than any other (says he one joystick and BASIC II in hand). They had on sale at the show OS 1.2 for £6.90 and BASIC II for £13.80. You can get the new OS cheaper from us but I've never seen BASIC II on sale elsewhere — it will be on sale from the shop normally I was told. A large range of software was on display as was a plotter for £86.25. Other items there was all the back issues of Acorn User, monitors, a very nice joystick from Clares — the best one I've seen so far (so was the price — £30!), printers, disk drives (Acorn and Torch). Two other items of interest were Micro Floppies for £129.95 (£198.90 with interface) and the Spark Jet printer.

**Honeyfold Software**, Standfast House, Bath Place, High Street, Barnet, Hertfordshire — Peter Holmes from Honeyfold came up and saw us showing off the new edition to the "Dr Watson Computer Learning Series", Beginners Assembly Language Programming For The BBC. It comes with a book and cassette all in a special wallet. At a brief glance it looks very good but we will review it in a later issue. It costs £14.95.

**Interface Publications**, 44-46 Earls Court Road, London, W8 6EJ — if they don't have a book out for every home micro I'd be surprised. Still only three books (two books and a program) out at the moment but watch out for another book . . . Hi Liz, Tim and Jeremy!

**Kansas City Systems**, Unit 3, Sutton Springs Wood, Chesterfield, S44 5XF — Kansas had a large display of software on sale. Their new advertisements in Acorn User talk about the cowboys in the market — have they seen the last two reviews in LASERBUG??? Galactic Firebird is good, the others . . .

**Kayde City Systems**, The Conge, Great Yarmouth, Norfolk, NR30 1PJ — Kayde had a light pen on sale for the BBC for £15 (normal price £19.95) and a sound module(?) for £8 (normally £9.95). We will be reviewing the light pen shortly (don't hold your breath, the pen isn't worth it)

**London and South Eastern Region BBC User Group**, 10 Dawley Ride, Colnbrook, Slough Berks., SL3 0QH — who? We haven't used the name London . . . since April '82, I wish other people would forget it. The name is LASERBUG, forget that at your peril!

**Maplin Electronic Supplies**, Unit A, Oak Road, South Hadleigh, Essex — are you a snob? Would you let your super upper class BBC Micro talk to a working class ZX81. Maplin would have none of this, they had a BBC Micro talking to a ZX81 and vice versa. In other words they had connected the two up using their new modem — well it's different!

**Microage Electronics**, 135 Hale Lane, Edgware, Middlesex — Nothing particularly exciting here, just the usual range of software and peripherals on sale. The most interesting thing was hearing the BBC Speech Chip for the first time. Oh yes, I brought the RH Electronics light pen from Microage. That is worth having. Review coming up . . .

**Mikrogen**, 24 Agar Crescent, Bracknell, Berks — (my mother's boss lives in Bracknell) Mikrogen (k?) had one solitary item for the Beeb — this strange red coloured dust cover with this little see-through window where the keyboard is so you can use your computer and keep it free from dust all at the same time!

**Micro Management**, 32 Princes Street, Ipswich, Suffolk — (Micro Management of the LASERBUG Software Charts, "The Worlds Largest List Of BBC Micro Accessories" and I couldn't get you an Electron till next Easter) had a huge stand with just about everything that you could think of for the BBC Micro. We've all seen their huge lists, most of it (except for the light pens) was on sale at the show. They had an econet set up as well.

**Micronet 800**, Bushfield House, Orton Centre, Peterborough, PE2 0UW — Micrognat (Definition: Micrognat (n) slang, used as a degradatroy name for Micronet 800. Source Micrognome) have upset me recently so they aren't getting more coverage than I can help. They had one solitary Beeb on display using the old acoustic modem and one Spectrum using the hard wired version — that's it. No new ROM, no new direct connect modem, nothing. Rather disappointing really (that can't be Sid Smith, can it?). Even so enough people were walking around with Micronet brochures. URGENT MESSAGE TO ALL MICRONET/PRESTEL USERS — SEE PAGE 8008128 AFTER 1st AUGUST.

**Micro Peripherals**, 61 New Market Square, Basingstoke, Hants — Come over and see our greeat new JUKI6100 Daisywheel Printer for only £399 plus VAT said Peter Walklate, UK Sales & Marketing Director of Micro Peripherals. I did and what happened? After he finished talking he had the choice of speaking to me or some strange person who wouldn't know a computer from a tube of glue. Who did he speak to? The tube of glue, not me. I am sure the JUKI is excellent but as I was never shown it . . .

**Microware**, 637 Holloway Road, London, N19 — Microware as in my disk drives. They had on display a large number of disk drives and printers for the BBC.

**Opus Supplies**, 158 Camberwell Road, London, SE5 0EE — Opus had on display a large range of goodies for your BBC Micro like disk drives, monitors and furniture.

**Postern**, P.O. Box 2, Andoversford, Cheltenham, Gloucestershire GL5 5SW — Postern, a new company, were selling three programs (Shadowfax, Snakepit and Seige) for the BBC, Commodore 64 and Spectrum. All three games were different from the usual kind of thing and all will be reviewed at a later date.

**Quicksilva**, 92 Northam Road, Southampton, SO2 0PB — if you haven't got a Spectrum (if you have how do you do Time Gate?) Quicksilva do three programs of interest — Music Processor (when I went to W H Smiths at Staines to buy a copy I spent half an hour in the shop and was told by the assistant that although they've got the box for the program they don't appear to have the actual program!), Protector and The Wizard.

**Reflex**, Wellington Industrial Estate, Basingstoke Road, Spencers Wood, Reading, Berks. — Reflex did have a couple of nice looking colour monitores on display. However what they did have was a data viewer — you can connect your BBC Micro up to it and instead of being a monitor, it is a projector enabling you to show a large number of people what is going on. It would be great for exhibitions, shops, etc.

**Romik Software**, 272 Argyll Avenue, Slough, Berks — (you are only just down the road, why haven't you popped in to see us?) Romik had two programs on sale for the Beeb, Birds of Prey and Atom Smasher, both at £9.99.

**Salamander Software**, 17 Norfolk Road, Brighton — (Salamander as in EDG) — Salamander had a large stand with lots of nice programs like EDG on disk, Dragon Rider, Tanks and two games compendiums.

**Shards Software**, 10 Park Vale Court, Vine Way, Brentwood, Essex, CM14 4UR — (not another software house!) Shard produces just one program for the BBC, Fun to Learn which is a comprehensive educational package.

**Shiva Publishing**, 4 Church Lane, Nantwich, Cheshire — (where is that book you promised me for review at the PCW Show last year?) Shiva had a number of books on show with one aimed at the Beeb beginner.

**Stack**, 290-298 Derby Road, Bootle, Liverpool, L20 8LN — Stack had a light pen available for the Beeb which cost £25 and came with £5 worth of free software. I didn't buy this light pen so unless Stack are generous we won't be reviewing this one next month.

**Sunshine**, Hobhouse Court, 19 Whitcomb Street, London, WC2 7HF — nothing to say here apart from hello Ian!

**Virgin Games**, 61/63 Portobello Road, London, W11 — Virgin, known up until now for records, had their new range of software on show including three for the BBC. One is Landfall which we have reviewed before when it was marketed by GT Software but the other two Space Adventure and Bug Bomb will be reviewed in due course. Despite some comments I have heard the games are quite good.

**John Wiley & Sons Ltd.**, Baffins Lane, Chichester, Sussex, PO19 1UD — John Wiley had a large range of Acornsoft programs on sale (although none of the new ones).

If all of the sounds like I'm cracking up it's because I am — five days at a show (one day setting up) is enough for anybody (and the PCW Show is five days just of the exhibition not including setting up/packing away and the Barbican is just a converted car park and . . .).

I am sure I have missed out people above and if I did I apologise — I'll try to get you in a mention another time. The next show we will be attending is the Acorn User exhibition, details in the news page.

Thanks are due to Maureen and Mark for their invaluable help (even if Mark did spend most of his time playing the games on other stands!), Fred for his help in setting up and designing the stand, etc., Rose for putting up with Fred, the ACC for letting us attend and all the great work they do, David "Prestel van Gough" Annal, May for looking after our dog(!), Terry for letting Maureen have time

off work, those poor people from Sterling Guards who sat with our stand while we took half of our stuff back, and to the car for managing to carry all of it in the first place. Thanks also to every one who came and saw us. See you all in August . . .

Paul Barbour

## top ten programs

A new feature — the top ten best selling programs. These are produced with the help of Micro Management and cover the month of June.

1. Rocket Raid	Acornsoft
2. Killer Gorilla	Program Power
3. Monsters	Acornsoft
4. GB Ltd.	Simon W. Hessel
5. Snapper	Acornsoft
6. Wordwise*	Computer Concepts
7. Creative Graphics	Acornsoft
8. Chess	Program Power
9. View*	Acornsoft
10. Colossal Adventure	Level 9

NOTE: All programs require a Model B. Programs marked with a\* are in ROM.

We would like to thank Micro Management of 32 Princes Street, Ipswich, Suffolk for their help in producing this chart. You can contact MM on 0473-59181.

## book review

**TITLE:** The BBC Micro—An Expert Guide

**AUTHOR:** Mike James

**PUBLISHER:** Granada Publishing, P.O. Box 9, Frogmore Street, St. Albans, Herts. AL2 2NF.

**PRICE:** £6.95

This book is aimed at two specific types of readers — those who are familiar with computing, BASIC, etc., have just got a BBC Micro and want to learn about its more interesting capabilities and a person who has bought a BBC Micro learnt how to program it and wants to know more. It covers both software and hardware in some 156 pages. The book is split up into 10 sections — (i) Preface, (ii) the Hardware, (iii) BBC BASIC, (iv) The MOS, (v) The Video Display, (vi) The Sound Generator, (vii) Interfacing, (viii) Introducing Assembler, (ix) Assembler II, (x) Postscript.

The first chapter is all about the overall hardware. It starts off by looking at the 6502 and the memory (both RAM and ROM) including all about the 4 paged ROM sockets and what they can contain. Next the video section of the computer is looked at briefly (as there is a whole chapter on this later on) and among other things explains the hardware differences between MODE7 and the other MODEs. The Interfaces are examined - the cassette and RS423, the VIAs, the 1 MHz bus and the tube. Most of these topics are investigated in quite some detail. Finally at the end of the chapter all these things are put together to form the actual computer.

The second chapter looks at the computer's language, BBC BASIC. Remembering that one type of reader for this book is someone who has come onto the Beeb from another machine, the teaching of procedures and functions is very important and as such over 5 pages are spent on the topic. The use of indirection operators and hexadecimal are demonstrated, thus leading into the way BBC BASIC uses the memory. The specific uses of areas of memory are shown followed by the way program lines are stored. How variables are handled, formatted and stored is all explained culminating in a variable, procedure and function dump program is given. A mention to LOCAL variables rounds off the chapter.

The third chapter deals with the operating system — it is interesting to note here that Mike James assumes the reader is using

a series 1 operating system, no mention is made to the old 0.1 version with which a number of his comments are not applicable. A few of the \*FX commands are described — however these are only ones in the manual, no new calls here at all (Mike James should have a subscription to LASERBUG — he would know most of the \*FX calls then!) A number of OS routines are described briefly followed by an example of how to create you own \* commands. Four pages on interrupts finishes off chapter three.

Chapter four looks at the video display — most of this chapter is based on an article from Computing Today. Briefly the screen map is examined in all modes (except 7) including how to write to read from the screen. The 6845 and ULA are looked at including use of VDU23 to alter the 6845. Hardware scrolling is discussed and the chapter is rounded off with MODE7. Chapter five is also based on material from Computing Today so again we will only look at it briefly. It is all about sound — the simple sound statement is looked at followed by its more complex version, then the note values are compared to musical notes, you are shown how to create simple sound effects using channel 0 and of course the envelope command is described. The hardware that actually produces the sound is looked at and you are shown how to make sound in machine code.

Chapter six deals with interfacing — firstly the A/D converter, then the user port and 6522 VIA. Both items are dealt with most thoroughly, even the complex 6522 chip.

Chapters seven and eight go into the whole area of assembly language. The topic is dealt with as completely as anyone could in 38 pages — several assembly programs are shown including a text screen dump program, RS423 terminal, moving graphics and a pulse generator.

Over all the book was good, however it was aimed at the wrong person. Despite what the preface says, the book is mainly concerned with the hardware of the computer rather than software. If you want to learn more about the insides of your computer which in turn should lead to a better over all understanding of the BBC Micro then this book is for you. Assembly language is a complex task and can't really be dealt with fully in just a few chapters — a whole book is required. This kind of thing however is what was missing from the manual.

As a final summary although the type of reader described in the opening sentence is who this book is for, you really need to be more hardware orientated to get the most out of the book.

## speech review

The BBC Speech System is not an extra peripheral that you can just plug in to your computer, it is an upgrade kit that must be fitted by an Acorn dealer. If you look on page 498 of the user guide in the bottom left hand corner you will see provision made for the Voice Synthesis Memory and Voice Synthesiser Processor. This is where the two chips plug in — on an issue 4 board the chips just plug straight in, on an issue 2 or 3 quite a few complex modifications have to be carried out. At the same time the speech system is fitted, the ROM upgrade is also installed — more on this later.

To operate the speech synthesiser, a version of the sound command is used which basically is:

SOUND a,b,O,O

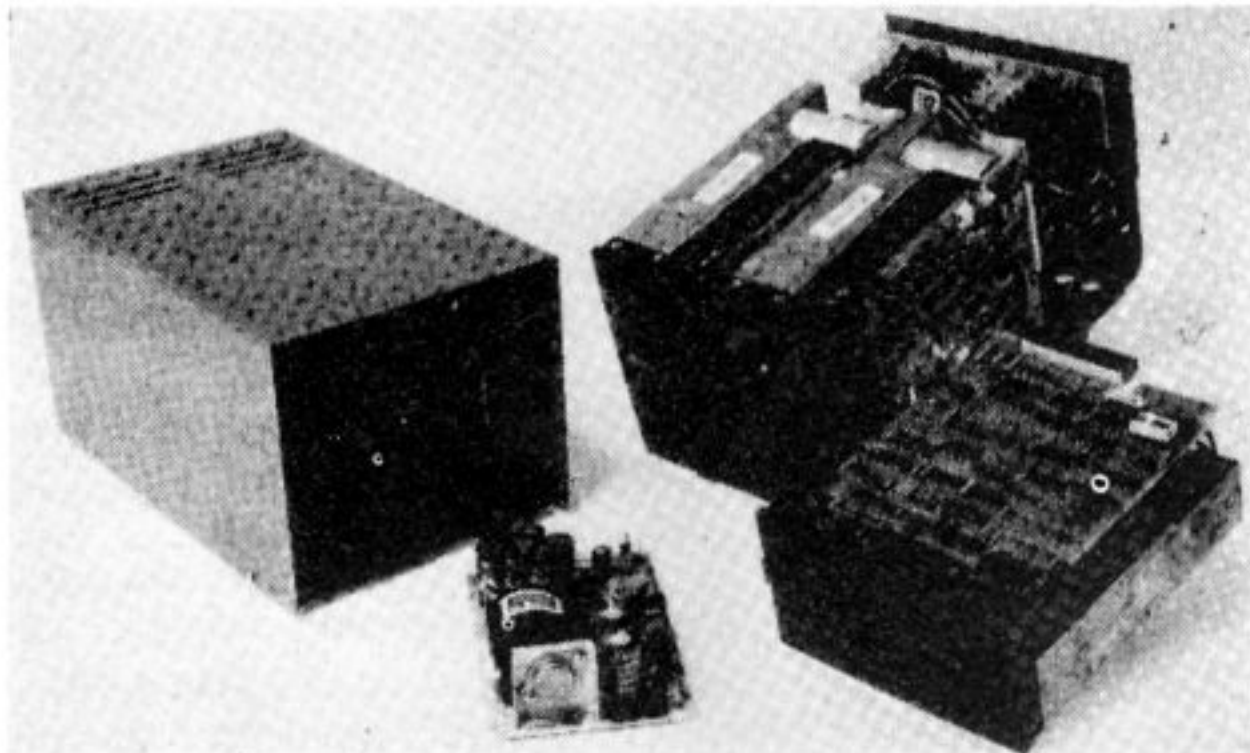
The a is at the present always -1. The b is the actual word number. At the moment the only store of words is in PHROM (Phrase Read Only Memory) A — the system has the ability to access 16 PHROMs. PHROM A has been given the value &F and hence is donated by &FFFF and is much easier to understand. A second PHROM would be given the code &E or &FFFE which means you would use -2. b is the word number which is between 32 and 291 — a full list of all the words are given in the 38 page manual you get with the system.

Making sentences therefore is quite easy. Supposing we wanted to make the computer say "BBC Computer". The BBC part can be obtained in two ways. Word numbers 127-291 are all the possible words, part words, tones and pauses that the computer can produce.



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Per track	2.1 kbytes	4.1 kbytes	4.1 kbytes
Code	MFM	MFM	MFM
Transfer Rate	125 kbits/s	250 kbits/s	250 kbits/s
Average latency	less than 100 ms	less than 100 ms	less than 100 ms
Seek Time			
Track to track	less than 5 ms	less than 5 ms	less than 5 ms
Average Access	less than 80 ms	less than 80 ms	less than 132 ms
Setting time	less than 15 ms	less than 15 ms	less than 15 ms
Head Load Time (OPT)	less than 50 ms	less than 50 ms	less than 50 ms
Media	hard/soft sector	hard/soft sector	hard/soft sector
Rotational Speed	300 r/min	300 r/min	
Track Density	48 TPI	96 TPI	
Flux Reversal Density (track 39, side 1)	5876 FRI	5922 FRI	
Number of Tracks	40	80	
Inner recorded radius (side 0)	1.437 in (36.50 mm)	1.385 in (35.2 mm)	
Outer recorded radius (side 0)	2.250 in (57.2 mm)	2.250 in (57.2 mm)	
Inner recorded radius (side 1)	1.354 in (39.39 mm)	1.344 in (34.1 mm)	
Outer recorded radius (side 1)	2.167 in (55.0 mm)	2.167 in (55.0 mm)	

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40 80 switchable

However words 32-126 are repeats of the more useful words—the idea being that as well as words number 159 being A, word 65 is also A thus corresponding with ASCII A. So, to produce the letter B you would either use SOUND-1,170,0,0 or SOUND-1,ASC("B"),0,0 or just SOUND-1,66,0,0. The C can be produced in the same way. Computer is word number 179 and so SOUND-1,179,0,0 would say that. So, to say the entire sentence you would need a program such as:

```
10 SOUND-1,ASC("B"),0,0
20 SOUND-1,ASC("B"),0,0
30 SOUND-1,ASC("C"),0,0
40 SOUND-1,179,0,0
```

Notice that there is no need for pauses between words. This method could be expanded to say a much more complex sentence:

```
L.
10 MODE7
20 PRINT"This is the BBC Computer returning you"
30 PRINT"to the TV Programme"
40 REPEAT
50  READA
60  SOUND-1,A,0,0
70  UNTILA=31
80  DATA270,209,267,66,66,67,179,252,133,275,143,267
,84,86,247,31
>
```

Using the ASCII/Speech similarities, your computer can say its alphabet:

```
L.
10 MODE7
20 PRINT"The alphabet..."
30 PRINT
40 FOR X%=65TO90
50  PRINT CHR%X%;
60  SOUND-1,X%,0,0
70  TIME=0:REPEATUNTILTIME=50
80  NEXT
```

Something such as counting up to 100 is more difficult. The computer can say the number 0-9 by running through the ASCII codes for characters 0-9. 10-12 all have their own codes. 13-19 is a little more tricky. The computer has stored thir-, fif-, six-, seven-, eight-, nine-. So what you have to do is say the prefix thir- and then add -teen onto it. The idea of just having half the words there is that four- can be fourteen but also forty. Combining the number prefixes, -ty and the numbers 1-9, 20-99 can be produced. Finally 100 is said by saying one and hundred together. Putting all this together gives you:

```
>L.
10 MODE7
20 PRINT"Your computer can count..."
30 FORX%=48TO57
40  SOUND-1,X%,0,0
50  NEXT
60 REM 10 - 12
70 REPEAT
80  READX%
90  SOUND-1,X%,0,0
100  UNTILX%=31
110 DATA264,190,273,31
120 REM 13 - 19
130 FORX%=146TO159STEP2
140  SOUND-1,X%,0,0
150  SOUND-1,135,0,0
160  NEXT
```

```

170 REM 20 - 99
180 FORX%=34T041
190 SOUND-1,X%,0,0
200 SOUND-1,137,0,0
210 FORY%=49T057
220 SOUND-1,X%,0,0
230 SOUND-1,137,0,0
240 SOUND-1,Y%,0,0
250 NEXT
260 NEXT
270 REM 100 !
280 SOUND-1,142,0,0
290 SOUND-1,140,0,0

```

Unfortunately the list of words you can use is very limited — many essential words have been omitted. There are no directions at all — left, right up and down would have been useful. The vocabulary is very un-human — please and thank-you are possible but very little else. Most of the words seem to be orientated to computing — cassette, character, data, error, escape, file, illegal, input, parameter, press, return, running, etc. Nevertheless 164 different words does give you quite a bit to play around with and most imaginative people should be able to get the computer to say something with most programs, the overall vocabulary isn't that bad and at least it speaks in the Queens English (or should I say BBC English as it is the ex-BBC Newsreader Kenneth Kendal who's voice was digitised for the chip — despite what other people say I can tell who's voice it is.

You could, and I emphasise the word could, make up your own words for the computer to say. If you thought that ENVELOPE was complex listen to this, to make up the word zero yourself would require 144 different values !!! I'm sorry, ENVELOPE I might experiment with but if you think I'm ever going to try to define my own word, forget it. No doubt somebody will come up with a program one day to help you do this but I can assure you it won't be me. So, the only other way to get extra words is to wait for some software house (or Acorn) to come up with more PHROMs which leads me neatly to the ROM upgrade.

At the same time as having the speech system fitted, the ROM cartridge filing system is also put in place. This means that at last the hole in the left of the keyboard is filled up. When you get your computer back after having the upgrade fitted you should find a little black cover over the hole. Lifting off this cover reveals two 12/2 pin sockets for fitting ROM cartridges. The ROM filing system is activated by a \*ROM command but as nobody has produced any cartridges yet, I couldn't tell you exactly how it will work. Details are given in the manual as to how to code information for the ROM cartridges so it shouldn't be too long before a company other than Acorn comes up with something. The idea is that you will be able to fit extra word PHROMs in these slots thus expanding the vocabulary. Hopefully a phonetic cartridge (i.e. one that instead of storing words, stores parts of words thus enabling most words to be formed) will be available shortly.

Finally, for when you do buy your speech chip, below is a simple game. I will not tell you the rules, I'll let the computer tell it to you itself!!!

```

L.
10 REM Simple Speaking Game
20 REM by Paul Barbour
30 :
40 REM 14/7/83
50 :
60 REM Version 1.0
70 :
80 REM Takes up 1.03k memory
90 :
100 REM Requires speech chip
110 :

```

```

120 REM (c) LASERBUG 1983
130 :
140 :::::
150 :
160 MODE7
170 PROCstart
180 CLS
190 VDU23,1,0;0;0;0;
200 FORlevel=400T00STEP-10
210 PROCkey
220 PROCget
230 IFanswer%=TRUE THENPROCend:END
240 PROCcorrect
250 NEXT
260 END
270 :
280 :::::
290 :
300 DEFPROCdelay(time)
310 TIME=0:REPEATUNTILTIME=time
320 ENDPROC
330 :
340 DEFPROCstart
350 PRINTCHR#134;"Start in";CHR#131;
360 SOUND-1,260,0,0:SOUND-1,207,0,0
370 PROCdelay(125)
380 PRINT"10 ";
390 SOUND-1,264,0,0
400 FORX%=57T049STEP-1
410 PROCdelay(75)
420 PRINTCHR#X%;" ";
430 SOUND-1,X%,0,0
440 NEXT
450 SOUND-1,58,0,0
460 PROCdelay(150)
470 ENDPROC
480 :
490 DEFPROCkey
500 key%=RND(26)+64
510 PRINTCHR#134;"Press";CHR#131;
520 SOUND-1,246,0,0
530 PROCdelay(RND(50)+50)
540 SOUND-1,key%,0,0
550 PRINTCHR#key%
560 ENDPROC
570 :
580 DEFPROCget
590 *FX15,1
600 *FX202,32
610 answer%=INKEY(level)
620 IFanswer%(<)key%THENanswer%=TRUE
630 ENDPROC
640 :
650 DEFPROCcorrect
660 score%=score%+1
670 SOUND-1,58,0,0
680 PROCdelay(75)
690 ENDPROC
700 :
710 DEFPROCend
720 CLS

```

```

730 SOUND-1,59,0,0
740 PROCdelay(75)
750 PRINTCHR$134;"SCORE:";CHR$131;score%
760 PRINT"CHR$130;"Thank-you for running this progra
m"
770 SOUND-1,265,0,0
780 SOUND-1,275,0,0
790 SOUND-1,147,0,0
800 SOUND-1,254,0,0
810 SOUND-1,270,0,0
820 SOUND-1,247,0,0
830 PRINT
840 ENDPROC

```

Overall I was quite pleased with the speech upgrade. It does work, and work well at that. It's limited vocabulary should not be too much of a problem if you think carefully about what you want to say. The ROM upgrade is not available separately and if you primarily want this, you will have to buy the speech chip. There are no plans to split up the packages. The speech chip has good educational prospects as well as being simply fun to use and I unhesitatingly recommend it to everyone.

The Speech System costs £55.00 inclusive, includes the ROM upgrade and a manual (and the 1.2 ROM if you need it). I would like to thank everyone at Technomatic Ltd. for their invaluable help with this review. The speech upgrade is available now (and has been since 8th July) from Acorn dealers. That great company Technomatic can be found at 17 Burnley Road, London, NW10 1ED. Telephone 01-452 1500/450 6597.

Paul Barbour

## comp prog review VI

The Computer Programme II — Making The Most Of The Micro  
Presented by Ian McNaught Davis

With Alan Crown, Hazel Ratcliffe, Christine Wathen, Colin Harris,  
Patrick Eager, Ian Trackman.

Reporter Catherine Robins

Produced by David Allen

### Episode VI — Getting Down to Business

This episode opens in a small family bakery, run by Alan Crown. The bakery serves eight shops and Alan was finding it hard to keep track of all his products having just a limited management — "It's very very difficult to control what you're making and what's going to which shop. We knew it was being made in the bakery because we did have a sheet filled in by them telling us what they'd made but we didn't know what shop it was going to, that was basically down to the manageress' and the driver. If the manageress thought they needed a bit more they asked for it but what that usually meant was that somebody else got a bit less." The answer to Alan's problems was a "Spreadsheet" program (running out of interest on an 80 column PET). For a moment we are taken back to the studio and a BBC Micro for a demonstration of the principles behind spreadsheets. Back with Alan on his spreadsheet he has all the shops across the top and all their different lines down the side. If say one shop wants more of one particular item just this one number has to be altered which then filters through the rest of the sheet, changing for instance the number of flour bags used. This is then printed out and used by the bakery — not only does it mean the right quantity of each item can be produced but the exact quantity of the ingredients needed is also calculated. All in all, this has led to Allan's business being much more efficient.

Back in the studio we see Mac using an excellent spreadsheet program (in colour!) on a BBC (the program is the ROM based ULTRACALC and will soon be available from BBC Soft for around £50 — for more details see the news section). Mac takes the scenario of a Landscape Gardener. The present situation of the gardener is

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shown which is fairly healthy. The question of what would happen if his revenue doubled in the summer by getting another person was asked. Altering just two numbers on the spreadsheet shows that he would be overdrawn in the summer months. The gardener could now take all this information to his bank manager and attempt to get an overdraft facility on the grounds that by the winter he would have increased his profits considerably on the previous year.

Next we move to the real world again and a problem which sounds fairly familiar. After giving up their work as teachers, two ladies set up a series of notes and leaflets on machine knitting which soon turned into a full colour magazine. 12 issues later their magazine has a circulation of around 8000 and obviously is giving them problems with all the paperwork i.e. subscriptions, invoicing. Hazel Ratcliffe and Christine Wathen have identified the fact that a computer would aid them but do not know which one to buy due to the overwhelming choice they have — ". . . if there was somewhere were you could tell them exactly what you needed and then they could assure you that this was the piece of equipment that not only suited you now, but would suit you as the business grew because hopefully the business is going to grow and if it grows at the rate it has done over the last two years then we don't want to buy a computer that's going to be obsolete in a couple of years time." An organisation that would do all of that is the NCC Microsystems Centre in London. Colin Harris of the NCC looks carefully at their problem and comes up with a package that would suit most of their needs (based around CP/M Cardbox) for between £3/4000. Their problem was solved with a commercial package but there is another way — write your own!

We meet again the cricket photographer Patrick Eager. He uses a package to help him with the day to day running of his business and wrote the whole package himself. Basically he converted the manual system he had been using to the computer which led to a custom designed program that did everything he needed. For instance his accounts program does away with all the accounting terms and simply uses plain English. He finds now that having a program that does what he wants it to, he now has much more time to go out and actually take photographs.

Ian Trackman, who wrote most of the software used in the two Computer Programme series', is asked by Mac if Patrick Eager's method of writing his own package was a good idea. He quite definitely says it isn't (which is funny as when this programme was originally broadcast I was in the middle of writing my own invoicing program!). He says that the real cost in terms of time far outweighs that of what it would cost to buy a commercial program.

Colin Harris sets down a clear method of the way to buy a business program — (i) look in the national magazines for some packages that seem to be what you want, (ii) go to a dealer and actually try the programs out and (iii) ask the dealer for a list of people who are actually using the programs so you can get their opinions. Another way is to go to an independent consultant who should be able to clarify what the persons needs are and select the best package. Finally Ian warns "if you don't go to a specialised consultant or somewhere like this you should be warned that there is an awful lot of rubbish around, rubbish software."

This program isn't really of that much interest to us Beeb owners — it is aimed at a much higher market (at least until the Z80 is available). Even so this program was of great interest to anyone interested in computers for business applications. Several scenarios are shown and many warnings were given in an attempt to stop people making expensive mistakes by jumping straight into the market.

Paul Barbour

## basic BASIC III

**BASIC WORDS COVERED THIS MONTH:** STEP, TIME, READ, DATA, RESTORE

**OTHER TOPICS COVERED THIS MONTH:** Variable types—integer, variable, string

At the end of last month we set two questions. A program to print out all the possible combinations of a dice was really a simplified version of the last program in that article:

```
LIST
10 FOR DICE1=1 TO 6
20 FOR DICE2=1 TO 6
30 PRINT DICE1;" - ":DICE2
40 NEXT
50 NEXT
>RUN
1 - 1
1 - 2
1 - 3
1 - 4
1 - 5
1 - 6
2 - 1
2 - 2
2 - 3
2 - 4
2 - 5
2 - 6
3 - 1
3 - 2
3 - 3
3 - 4
3 - 5
3 - 6
4 - 1
4 - 2
4 - 3
4 - 4
```

```
4 - 5
4 - 6
5 - 1
5 - 2
5 - 3
5 - 4
5 - 5
5 - 6
6 - 1
6 - 2
6 - 3
6 - 4
6 - 5
6 - 6
```

>  
The program to print out the square should be:

```
>LIST
10 INPUT SIDES
20 FOR SIDE1=1 TO SIDES
30 FOR SIDE2=1 TO SIDES
40 PRINT"*";
50 NEXT
60 PRINT
70 NEXT
>RUN
?5
*****
*****
*****
*****
*****
*****
>RUN
?10
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
```

If the shape above doesn't look like a square don't worry — if you count up all the sides are the same length.

The first listing was just a slightly modified version of last months one so we won't bother to explain that. If you didn't get the second one though, I will show how it works. It starts off at line 10 by inputting the length the square has to be. Line 20 is the start of the loop that deals with how many rows there will be and the line 30 loop deals with the length of each row. Line 40 prints one star — the semi-colon after the quotation mark means that the next thing to be printed will appear in the next space after the star. The line 30 loop will carry on until the entire length of the row is done. When the row is finished, the PRINT makes sure that the computer leaves that line and goes back to the start of the next line. This will carry on until the whole square is done. Simple!

If you think a bit more deeply about FOR loops you might be able to see a limitation — supposing instead of counting from 1 to 10 we wanted to count from 10 to 100 in steps of 10. This isn't a limitation that BASIC has as there is an added command — STEP. Look at the following listing:

```
>LIST
10 FOR NUMBER=10 TO 100 STEP 10
```

```

20 PRINT NUMBER
30 NEXT
>RUN
    10
    20
    30
    40
    50
    60
    70
    80
    90
   100

```

>

That should be pretty self-explanatory. Last month we printed a program that printed out all the odd numbers between two numbers entered by the user. To determine whether or not the number was odd, we used a short mathematical routine. If we had used a FOR loop with a STEP 2 at the end all this would have become unnecessary. That original 8 line listing with some fairly complex words can be shortened down to:

```

>LIST
 10 INPUT FIRSTNUMBER
 20 INPUT SECONDDNUMBER
 30 FOR ODD=FIRSTNUMBER TO SECONDDNUMBER STEP 2
 40 PRINT ODD
 50 NEXT
>RUN
?1
?20
    1
    3
    5
    7
    9
   11
   13
   15
   17
   19

```

>

using this method.

Now would be a good time to look a little more closely at variables. In actual fact there are three different types of variables. The first type is called a **real numeric variable**. This can be any number within the range 1.7E38 (170,000,000,000,000,000,000,000,000,000,000,000) to 1.7E38 (0.000,000,000,000,000,000,000,000,000,000,000,017)!!! The second type of variable is a **integer numeric variables** which can only hold whole numbers in the range 2,147,148,647 to -2,147,148,647. We will deal with the third type in a moment but at present let us just look at the difference between the first two. Why, you might ask, have two different types of variable. The computer can handle integers much easier and quicker because there is less information to deal with. Why not then just have integer variables? Integer variables do work very fast and this is of course an advantage but they only have a limited range and cannot store fractions. For this reason real numeric variables exist. What is the difference between the two?

Before we answer that, there are a few things that must be made clear. Firstly a real variable just has its name i.e. number whereas an integer variable is denoted by placing a % after its name i.e. number %. The programs we are going to use to test the difference

between the two use a word called TIME. Inside the computer there is a built in clock. When the computer is first switched on or a hard break is performed, the clock is set to 0. One is then added to the clock every hundredth of a second. It is possible to set the clock back to 0 at any time with a line such as TIME = 0.

And so to the test. The first program runs a FOR loop using real variables and prints the time taken in seconds:

```

>LIST
 10 TIME=0
 20 FOR X=1 TO 2500
 30 NEXT
 40 PRINT TIME/100
>RUN
    1.26

```

and the second one uses integer variables:

```

>LIST
 10 TIME=0
 20 FOR X%=1 TO 2500
 30 NEXT
 40 PRINT TIME/100
>RUN
    0.45

```

>

As you can see using integers improves the speed considerably.

We will come back to TIME in a future article but now let us look at the third type of variable — **string variable**. A string variable does not store any form of number but instead holds letters and words. You denote a string variable by placing \$ after its name i.e. NAME\$ = "PAUL". In this example NAME\$ would hold the letters P, A, U and L all making PAUL. You cannot do any kind of arithmetic to string variables — you try working out what PAUL divided by MARK is ???! Although it uses the same sign, + can be used on strings and carries out addition of sorts but not normal mathematical addition. Supposing you had the string FRUIT\$ = "APPLE" and ADD\$ = "PEARS". If you used a line such as ANSWER\$ = FRUIT\$ + " + ADD\$ you would find that ANSWER\$ contain the sentence "APPLEPEARS".

Another thing you can do to string variables that you did with numeric variables is use them in an IF statement. For instance a line such as IF CONTINUE\$ = "N" THEN END would stop the program if the user entered N at a INPUT CONTINUE\$ line.

Let us try to put all this together:

```

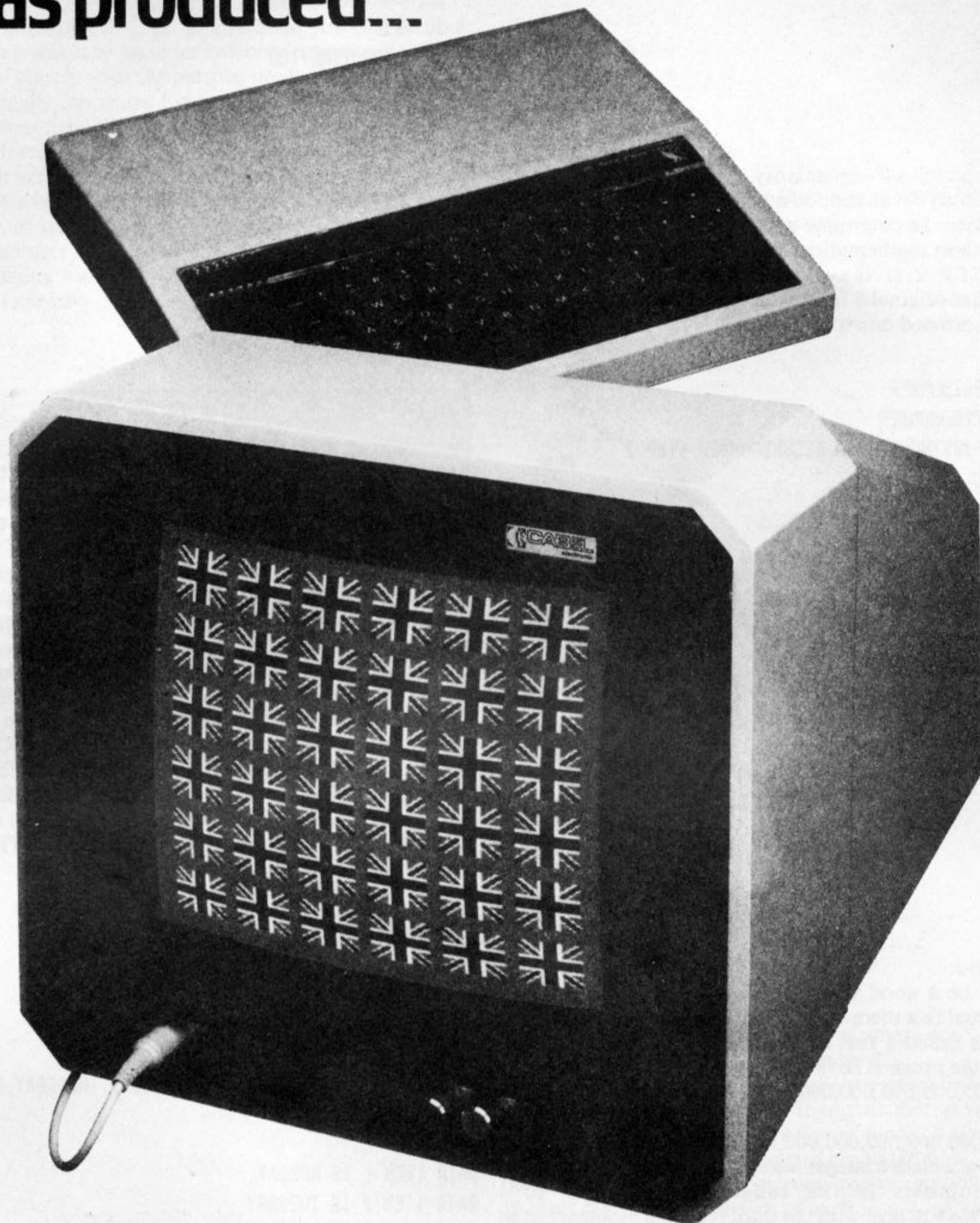
>LIST
 10 FOR INFO=1 TO 7
 20  READ INFO%
 30  PRINT"DATA ITEM ";INFO;" IS ";INFO%
 40  NEXT
 50 END
 60 DATA MONDAY,TUESDAY,WEDNESDAY,THURSDAY,FRIDAY,SA
TURDAY,SUNDAY
>RUN
DATA ITEM 1 IS MONDAY
DATA ITEM 2 IS TUESDAY
DATA ITEM 3 IS WEDNESDAY
DATA ITEM 4 IS THURSDAY
DATA ITEM 5 IS FRIDAY
DATA ITEM 6 IS SATURDAY
DATA ITEM 7 IS SUNDAY

```

>

That isn't much of a conversation but it shows you what your computer is capable of. Try building up a program of your own on the same theme. There are many different things you can do to strings. We will cover these in a later part of Basic BASIC but if you are impatient look at the article String, String, String on page 16 of Issue 6 Nov'82 LASERBUG.

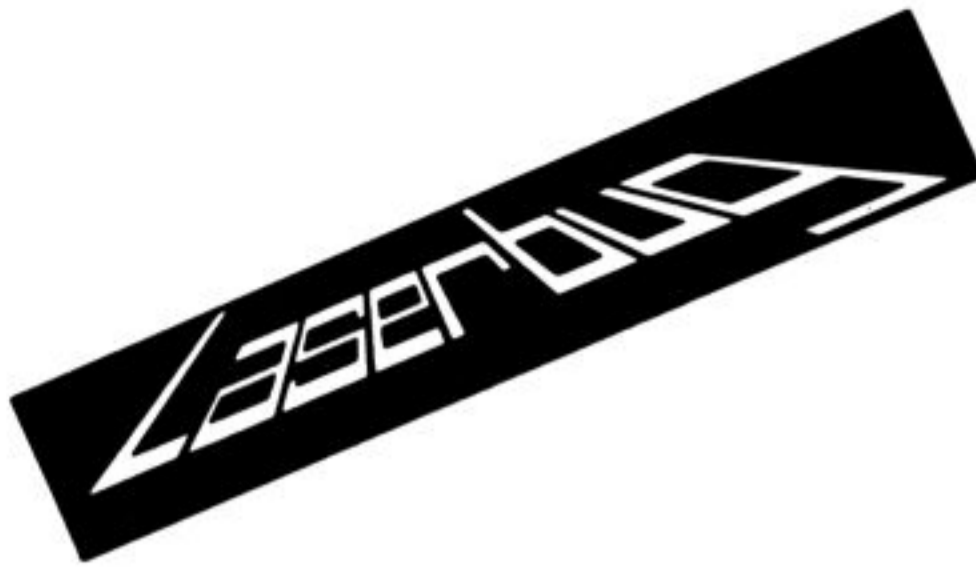
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PRESENTS



## SOFTWARE SEARCH

Have you written a REALLY good program lately? If so what are you going to do with it. Nothing? Send it to a magazine for maybe £10 or £20? Attempt to sell it yourself with all the risks that involves? Enter it in the LASERBUG Software Search competition and possibly win an RGB Monitor? If you've any sense then there is only one answer!

Quite simply, LASERBUG is searching for some good software – the kind that you don't run once and then discard but keep using over and over again. We would like to see all kinds of programs – games, educational, business and utilities.

The programs will be judged on their individual merits and the winner will receive an RGB Monitor donated by Cabel Electronics. There will be one monitor to win each month for the next 12 issues.

Programs may be sent either on cassette or disk. If on cassette, please supply a copy at both 300 and 1200 baud. For disks, we will accept both 40 and 80 tracks on either single or double sided disks. Please do not send us your only copy of the program as we will not be able to return any. Make sure your name and address is on the cassette/disk and any accompanying documentation. Employees/relations of employees of either LASERBUG or Cabel Electronics are not eligible for entry in this competition, as are non-members of LASERBUG. There is no cash alternative for the prize. The closing date for Software Search 2 is the last working day in September. The winner will be notified by post and their program may be printed in LASERBUG, included in a Software Library or perhaps both. In both events the author will be acknowledged but no further payment made. The program must be the authors own, unaided work and should not have been submitted elsewhere. Judging will be carried out by the LASERBUG editor and the editor's decision is final. No correspondence will be entered into with regards these rules.

-----

### SOFTWARE SEARCH 2 ENTRY FORM

I enclose a program for entry to the LASERBUG Software Search competition, the details of which are:

PROGRAM NAME ..... REQUIREMENTS .....

PROGRAM TYPE	<input type="checkbox"/> GAME	MEDIA	<input type="checkbox"/> CASSETTE
	<input type="checkbox"/> EDUCATION		<input type="checkbox"/> 40 TRACK DISK
	<input type="checkbox"/> BUSINESS		<input type="checkbox"/> 80 TRACK DISK
	<input type="checkbox"/> UTILITY		
	<input type="checkbox"/> OTHER (please specify)		

PROGRAMMERS NAME..... MEMBERSHIP NUMBER .....

ADDRESS.....  
.....

I am a member of LASERBUG. The program I have submitted to this competition is my own, unaided work and has not been sent to any other organisation. I understand that if I win this competition I will receive an RGB Monitor in exchange for full rights to the program. My program in turn may be printed in LASERBUG or included as part of a software library. In either case I will be acknowledged but not receive any further payment. I accept the rules laid down in this competition and agree that the editor's decision in judging the winner is final.

SIGNED..... DATE .....

- If I do not win Software Search 2, I would like my program to be entered for Software Search 3, 4, etc.
- If I do not win Software Search 2, I wish my program to be withdrawn from the competition.

THE FINAL CLOSING DATE FOR SOFTWARE SEARCH 2 IS THE LAST WORKING DAY IN SEPTEMBER

You may enter more than one program in the competition but each entry must be accompanied by a copy of this form. Your entry is not valid unless it is signed and your membership number included.

Something new! Look carefully at the following program:

```

>LIST
 10 PRINT"ENTER YOUR NAME"
 20 INPUT NAME$
 30 CLS
 40 PRINT"HELLO ";NAME$
 50 PRINT"IS IT SUNNY TODAY ?"
 60 INPUT QUESTION$
 70 IF QUESTION$="YES" THEN PRINT "I SUGGEST YOU SUNB
ATHE" ELSE PRINT "TAKE AN UMBRELLA IF YOU GO OUT"
>RUN
ENTER YOUR NAME
?PAUL

HELLO PAUL
IS IT SUNNY TODAY ?
?YES
I SUGGEST YOU SUNBATHE

```

All the information or data is stored in one line of the program — preceded by the word DATA. This is stored at the end of the program but it doesn't really matter where it goes. Line 10 sets up the FOR loop to read seven pieces of data. Line 20 actually reads the item of data from the list and stores in INFO\$, Thirty prints out all the information. When the computer receives a READ command again then it simply reads the next one on the list.

There are some rules that you should know. Firstly you must not try to read more data than exists — if you do you will get an "Out of DATA" error message. The data does not have to be words, it could have been numbers and read into a numeric variable. If you do want words if there is to be a space between words in one item of data or you want to use a comma, you need to enclose the words in quotation marks i.e. DATA "Day 1, Monday", "Day 2, Tuesday". All the data does not have to be stored on one line — you can have as many data statements as you like. The computer will just carry on to read one item after the next unless it receives a command RESTORE nnnn where nnnn is the line number of the DATA statement that you want the computer to start from. One thing you cannot say is INFO\$ = READ.

To round off this months article, using your new found knowledge try answering the following question:

Q. Write a program so that when the user enters a number (1-12), the computer will print out the name of the month corresponding to that number i.e. 3 - March.

Paul Barbour

## consumer spot

The operating system of the BBC Micro is capable of supporting 16 paged ROMs. However, there are only 4 paged ROM sockets! Acorn have never even suggested how the computer addresses another 12 ROMs and so most people if they have a disk interface fitted only have space for another two ROMs. Watford Electronics tried to remedy the situation:

"13 ROM SOCKET BOARD — WATFORD's own 13 ROM Sockets Board for BBC Micro. It simply plugs into one of the four sockets currently available on the BBC Micro to give a full 16 ROM capability (in which all ROMs may be resident at once). The circuit has been designed to allow the full use of RAM in this area too. Introductory offer for the first 250 boards: Kit Only £25.00/Built & Tested Only £29.95"

Sounds very interesting doesn't it? Enough people have now fitted a 1.2 ROM to know how easy it is just to plug a chip in. Fitting sounds fairly easy therefore. Not a bad idea really, just plugging in one circuit board to allow you to have access to all 16 ROMs. Now that is the way we figure that most people would be thinking —

I would think anybody with a little patience is capable of plugging in a chip into a socket, or a circuit board into a socket for that matter.

We, like many other people, sent off an order for one of the boards. A while later a letter came back saying that the special offer for the first 250 boards had been filled and if we still wanted one, we would have to send off extra money. The board sounds popular doesn't it?

Eventually our board and everyone else's arrived. And what did we find? Well, far from fitting being just a matter of plugging the board into a socket, we find that some soldering is needed! So what, just a few simple wires to be soldered onto some special solder points? That couldn't be too hard? Not solder points we read, the wires have to be soldered direct onto the legs of a chip — a delicate operation. You must make sure that no solder drips on to the PCB and that you don't overheat the chip. So what he says again, soldering onto a chip shouldn't be that hard. It shouldn't be, unless that chip is hidden right underneath the keyboard ribbon cable making it extremely hard to get at. Take the ribbon cable off? Even so the chip is still very, very close to two others making it a hard job to be able to solder on wires and stop it from overheating.

So, this board was bought on the basis that it just plugged into a socket now needs some very complex soldering that should only be attempted by an expert.

After a good few months Watford Electronics did alter their advert to read "There are only 4 solder connections to be made" but how many people have already bought the board on the basis that it just plugs in, have found that it needs some extremely complex soldering and have just discarded the board or worse how many people have tried to fit the board and damaged their computer?

We have tried to get in touch with Watford Electronics but found their telephone constantly engaged. We have sent them two telex's and have not received a response to either.

We feel that the public has been quite openly misled by Watford Electronics. The very least Watford Electronics should do is refund customers money or perhaps fit the board for people if requested. Should they be allowed to get away with such things in the first place?

We will let you know more on this matter next month . . .

Paul Barbour

## soft review

[Note: Due to the fact that there are very few Model A's around now and that most programs are written for the B, unless stated otherwise all programs reviewed require a Model B (or a 32k Model A with 6522 VIA chip). All programs have been tested on both the 1.2 OS and BASIC II.]

**ARCADE GAME PROGRAM:** Killer Gorilla

**PROGRAM TYPE:** Machine Code

**DISK USERS:** Needs relocating

**OPTIONAL HARDWARE:** Joysticks

**SUPPLIER:** Micro Power Ltd., 8/8a Regent Street, Chapel Allerton, Leeds, LS7 4PE.

**PRICE:** £8.54 (including VAT and P&P)

**REVIEWER:** Trevor Lawford

**DESCRIPTION OF PROGRAM:** After promising myself that I would never buy a copy of an Arcade game that wasn't by Acornsoft, I was persuaded to try this on the strength of the fact that Micro Power included four good looking screen photographs in their advertisement. I was not disappointed: this adaption is SUPERB. I have absolutely no complaints: the action, graphics, sound and playability are totally professional. Four different screens buzzing with activity, then recycling with subtle changes. Your player runs, jumps, bashes and climbs — all in a superb piece of programming; and it even comes with an attractive and well written cassette inlay card. This is what buying software is all about. RECOMMENDED

**PRESENTATION:** ★★★★★

**USE OF GRAPHICS:** ★★★★★

**ADDICTIVE QUALITY:** ★★★★★



**LOADING PROBLEMS:** No  
**VALUE FOR MONEY:** ★★★★★

-o0o-

**EDUCATIONAL PROGRAM:** Tree of Knowledge  
**PROGRAM TYPE:** BASIC with machine code routines  
**DISK USERS:** Program will operate on DFS with a little work  
**OPTIONAL HARDWARE:** Printer  
**SUPPLIER:** Acornsoft Ltd., 4a Market Hill, Cambridge, CB3 3NJ  
**PRICE:** £9.95

**DESCRIPTION OF PROGRAM:** This program is an example of artificial intelligence. A specific topic is chosen i.e. Computers. After asking what the singular of Computers is you are asked for the name of a computer i.e. BBC B and then another i.e. ZX81. Now the computer wants to know a question that it could use to identify between the two items i.e. Does it have colour? Now the computer knows of the BBC Micro and ZX81 and can identify between them. Expanding on this, a very large store of information can be built up, enabling the computer to identify any machine you can think of just by asking questions. The overall idea of the program is to introduce children to using computers for the storage of information. It is quite comprehensive including the ability to edit and print out the tree. Two sample databases are supplied with the program — FRUIT and CLASS. RECOMMENDED

**PRESENTATION:** ★★★  
**USEFULNESS:** ★★★★★  
**NUMBER OF USERS:** Suitable for both individual and group use  
**VALUE FOR MONEY:** ★★★★★

-o0o-

**ARCADE GAME PROGRAM:** Galaxy Wars  
**PROGRAM TYPE:** Machine code  
**DISK USERS:** Easily transferable  
**OPTIONAL HARDWARE:** Joysticks  
**SUPPLIER:** Bug Byte Software, 98-100 The Albany, Old Hall Street, Liverpool L3 9EP  
**PRICE:** £7.50

**DESCRIPTION OF PRODUCT:** Out of a batch of four new releases from Bug Byte (others to be reviewed in future issues) this is about the best. You start off by having these little rotating balls moving from left to right getting closer and closer to you, whilst dropping bombs. At the same time some funny two coloured blocks are also moving down. You must simply clear the screen of everything in sight. Then we move onto some funny bow tie shaped objects acting in a likewise hostile manner which, as in all good invader games, must be destroyed. When you have got through all this you must dock your spaceship onto the mothership to refuel. A nice feature of the program is a "pause" facility which is enabled by pressing f0. A pretty average game by all respects — not one I would recommend rushing out instantly to get.

**PRESENTATION:** ★★★  
**USE OF GRAPHICS:** ★★★  
**ADDICTIVE QUALITY:** ★★★  
**LOADING PROBLEMS:** No  
**VALUE FOR MONEY:** ★★★★★

-o0o-

**EDUCATIONAL PROGRAM:** Polar Bear  
**PROGRAM TYPE:** BASIC  
**DISK USERS:** Needs relocating to & EOO  
**SUPPLIER:** Software for All, 72 North Street, Romford, Essex.  
**PRICE:** £7.45

**DESCRIPTION OF PROGRAM:** This is a tables tester developed into a game about a polar bear (!). A polar bear appears on the screen with his mouth open very wide. Inside his mouth will appear a multiplication question — you must say whether or not it is right (by pressing M) or wrong (Z). If you do not answer within a set time it is taken that you do not know the correct answer. If you get 6 questions wrong then the polar bear's mouth is completely closed and he looks ominously at you with one eye. You are shown one by one the

questions you got wrong and told whether they were right or wrong. The screen clears and you have to enter the correct answer to each question. If you are right you are rewarded with a picture of the bear, if you are wrong little pictures of the bears head are shown for you to count. After all questions have been answered you can either go back and try some more (the high score is recorded), look back at the instructions or end the program. Overall a good program and another way to tackle a standard problem. RECOMMENDED

**PRESENTATION:** ★★★  
**FOR AGES:** 10-12  
**SUBJECT:** Maths (Tables)  
**USEFULNESS:** ★★★★★  
**NUMBER OF USERS:** 1  
**LOADING PROBLEMS:** No  
**VALUE FOR MONEY:** ★★★★★

-o0o-

**UTILITY PROGRAM:** Music — SUITABLE FOR MODEL A  
**PROGRAM TYPE:** BASIC with machine code routines  
**DISK USERS:** Program will operate on DFS with a little work  
**SUPPLIER:** BBC Soft, 35 Marylebone High Street, London, W1M 4AA.

**PRICE:** £10.00  
**DESCRIPTION OF PROGRAM:** Unfortunately most of the BBC Soft programs have been rather mediocre — this one happily is an exception. You have the facilities to (i) Record/Edit, (ii) Play, (iii) Erase, (iv) Load, (v) Save, (vi) Tempo, (vii) Instrument. You have three sets of staves in front of you — one for each channel. Picking the record/edit mode allows you to pick which one you are going to alter. The keyboard then becomes a musical keyboard with the range C to A (approx. 1 and a half octaves). This enables you to have quite a good range of play. Pressing a key once will leave you with one duration — holding a key down will give you longer notes. Delete will get rid of the note under the cursor and space allows rests. To edit the tune you can move back via the cursor left key and forward via the cursor right key — when moving forward the computer plays each note it passes over. Full sideways scrolling is used to good effect. You can play just one of the staves or all three together, alter the tempo over a range of 10 steps and choose between 4 instruments (although only instrument 1 is of any real use). Overall a very useful package and one well suited to producing quite complex music. RECOMMENDED.

**PRESENTATION:** ★★★★★  
**USEFULNESS:** ★★★★★  
**LOADING PROBLEMS:** No  
**VALUE FOR MONEY:** ★★★★★

-o0o-

**ARCADE GAME PROGRAM:** BBC Space Invaders — SUITABLE FOR MODEL A  
**PROGRAM TYPE:** Machine code  
**DISK USERS:** Will operate on DFS with a little work  
**SUPPLIER:** David McKeran, 23 Warwick Drive, East Herrington, Sunderland, Tyne & Wear, SR3 3PU.  
**PRICE:** £5.00

**DESCRIPTION OF PROGRAM:** This is the zillionth version of Space Invaders I've seen for the Beeb — what's new about this one? Well, for a start it is the shortest version I've seen — some & 15 blocks. It works on EITHER a model A or B with no difference in the game between the two machines. You are not told what the keys are (A/D/: just in case you decide to buy it) but apart from that the game is quite good. It certainly isn't up to the standard of some I've seen but if you have a model A I would say clearly this is the best model A invaders I've seen so far. Apart from that £5 is a very good price for a program these days. RECOMMENDED FOR MODEL A OWNERS

**PRESENTATION:** ★★★  
**USE OF GRAPHICS:** ★★★★★  
**ADDICTIVE QUALITY:** ★★★  
**LOADING PROBLEMS:** No  
**VALUE FOR MONEY:** ★★★★★

**ADVENTURE PROGRAM:** The Golden Baton — SUITABLE FOR MODEL A

**PROGRAM TYPE:** Machine code

**DISK USERS:** Will operate on DFS with a little work

**SUPPLIER:** Digital Fantasia, 24 Norbreck Road, Norbreck, Blackpool, Lancs.

**PRICE:** £10.29

**DESCRIPTION OF PROGRAM:** "Venture into a strange province of Sorcery and Evil Magic to recover the Golden Batton, a priceless artifact whose powers are said to bring great Health and Prosperity to the Land" — that is the scenario for this adventure. The game uses colour in MODE7 and uses a split screen display with the top displaying your location and the directions you can move in and the bottom your commands, etc. The now familiar save game facility is included and all things considered makes this a reasonable adventure, if just a little too expensive for its complexity. Particularly useful is the fact that unlike most adventures it runs on the Model A. **RECOMMENDED FOR MODEL A OWNERS**

**PRESENTATION:** ★★ ★

**COMPLEXITY:** ★★ ★

**RESPONSE SPEED:** ★★ ★★ ★

**LOADING PROBLEMS:** No

**VALUE FOR MONEY:** ★★ ★

-o0o-

**UTILITY PROGRAM:** Character Generator

**PROGRAM TYPE:** BASIC

**DISK USERS:** Needs relocating

**SUPPLIER:** Viscount Software, Viscount Services Ltd., 2a Boulton Road, Southsea, Hants.

**PRICE:** £9.95

**DESCRIPTION OF PROGRAM:** This is a fairly comprehensive character generator program. It enables you to redefine the high numbered ASCII characters. You first of all pick which character you want to redefine using the cursor keys. You can then place the character anywhere on a 20 by 20 grid. Defining the character is done by moving a square around the grid — SPACE creates one pixel and DELETE gets rid of one. Other handy facilities at this part in the program are the ability to fill a whole row or column, rotate characters, reverse or even reflect them. As you are doing this by the side of each row is the value of that row to date for use in your own VDU commands. TAB finally defines the character — when you move on to do the next one you can decide to place it say next to the first character, thus enabling complex multi-character — when you move on to do the next one you can decide to place it say next to the first character, thus enabling complex multi-character designs to be built up. Facilities are of course included for saving the characters to tape in a form that you can use in your own programs. The main limitation of this program, or to be more precise the way it could be improved is to modify it so that when using a series 1 OS, all characters from 32 to 255 can be defined. Other than that this program is very good and is the best character generator I have seen so far. **RECOMMENDED**

**PRESENTATION:** ★★ ★★ ★

**USEFULNESS:** ★★ ★★ ★

**LOADING PROBLEMS:** No

**VALUE FOR MONEY:** ★★ ★★ ★

-o0o-

We would like to thank Acornsoft Ltd., Bug Byte Software, Software for All, BBC Soft, David McKeran, Digital Phantasia and Viscount Software for supplying us with review tapes. The Micro Power program was obtained independently. Our thanks also to Trevor Lawford for the review of Killer Gorilla. If you would like to join the LASERBUG Board of Software Reviewers please get in touch via our normal address stating what types of program you are capable of reviewing.

Before continuing our exploration of the 6502 instruction set it would be useful to understand a few concepts that I have not yet considered in detail.

**The Stack:** The PROC statement in BBC BASIC is very useful, allowing one to execute a routine (starting with the corresponding DEFPROC) and continuing execution of the calling program when ENDPROC is reached. This can be done from anywhere within the program even within the procedure itself. The assembler instruction JSR provides a similar facility in machine code. It may have occurred to some people to wonder how the program knows where to return to as a series of return addresses on the stack. Consider a pile of cards, with numbers on, such that you can only see the top card at any one time — the number visible being the last one added to the top of the stack. Each time that a PROC call, or JSR, is executed, the address of the next line is put on top of the stack, on a new card, and each time that an ENDPROC, or RTS, is encountered this number is taken from the stack and used as the return address and the card discarded to reveal the number put on the stack before that procedure was called, which may be the return address of a higher level routine. On the 6502 processor this stack is represented by a series of memory locations in the range &IFF to &100 and there is a special eight bit stack pointer to indicate to the processor where the top of the stack is.

**Two's Complement Arithmetic:** It should be possible by now to work out how to store a number in memory, or in one of the registers: a number between 0 and 255 can be stored as an eight bit pattern, larger numbers in several consecutive bytes. There are occasions when it is useful to be able to store numbers less than zero. Several conventions are possible but one of the most common is the use of two's complement notation. Imagine that before any number is stored a larger number is added to it so that negative numbers are stored as small positive numbers and positive numbers as larger ones. If the offset was 256, -2 becomes 254 (&FE), -64 become 192 (&CO) and 58 becomes 314 (&13A). Obviously numbers greater than 255 cannot be stored in a single byte but if we ignore this and store the lower eight bits of the nine bit numbers produced (thus halving the range that you can store, to -128 to 127) we arrive at a method of storing positive and negative numbers, known as two's complement. Therefore 58 is stored as &3A, 0 and 0, -2 as &FE and -64 as &CO. Conveniently this means that positive numbers are stored as themselves as well as allowing negative numbers to be stored. Considering it further (try writing out a short BASIC program to go through the values produced) it will be seen that negative numbers are stored with the top bit set (&80 to &FF). This top bit is known as the sign bit and it is copied in the condition code register if the result of an operation has its top bit set, indicating a negative number, and cleared otherwise.

Consider the SOUND command SOUND3,-15,256,1. The User Guide tells us that it can be accessed from machine code using OSWORD call 7 with the X and Y registers pointing to the parameters. A block of memory must be set up to pass 3,-15,256,1 as a series of 16 bit numbers. Remembering that the 6502 expects numbers stored in two bytes to be stored low byte, then high the parameters become 3,0,&F1,&FF,0,1,1,0. Notice that -15 has become &FFF1 as a 16 bit number in two's complement in the same way it became &F1 as an 8 bit number. Check out the following routine, which should produce a short sound.

Hopefully you should have some idea of what it is doing; if not it may become clear later.

```
10 DIM PARAM%8:REM clear space for control work
20 PARAM%0=3:PARAM%1=0:REM Channel 3
30 PARAM%2=&F1:PARAM%3=&FF:REM Volume -15
40 PARAM%4=0:PARAM%5=REM Pitch & 100
50 PARAM%6=1:PARAM%7=REM Length 1
60 X%=PARAM%AND255:Y%=PARAM%DIV256
70 A%=7:REM Point to parameters and initialise call
80 CALL&FFF1:REM Call OSWORD
```

This may seem pretty pointless when it is so easy from BBC BASIC as a direct command and obviously does not justify the long preamble above. However, the idea is extended slightly in the next listing:

```

>LIST
 10 DIM PARAM% 8
 19 REM set up parameter block
 20 PARAM%?0=3:PARAM%?1=0
 30 PARAM%?2=&F1:PARAM%?3=&FF
 40 PARAM%?4=0:PARAM%?5=1
 50 PARAM%?6=1:PARAM%?7=0
 59 REM get old output vector
 60 PRNT=?&20E+?&20F*256
 70 DIM P% 40
 80 C.CPIP
 89 \ set up tone value
 90 PHA:STA PARAM%+4
 99 \ save registers
100 TXA:PHA:TYA:PHA
109 \ point to parameters
110 LDX#PARAM%AND255
120 LDY#PARAM%DIV256
129 \ call OSWORD for SOUND
130 LDA#7:JSR&FFF1
139 \ restore registers
140 PLA:TAY:PLA:TAX
149 \ now write to screen
150 PLA:JMP PRNT
160 ]
169 REM now link it in
170 ?&20E=CPIP AND 255
180 ?&20F=CPIP DIV 256

```

Run this program, then try listing it. Do not run it twice without pressing BREAK in between. You will notice that it alters some memory locations: &20E and &20F. Looking at the user guide you will see these are the output routine vector. What we have done is altered some internal pointers so that when the operating system is asked to print something to the screen it executes our routine before jumping on to the ROMs own output routine. The problem with running the program twice is that on the second time round, when the program looks to see where the old output vector was pointing (line 60) it has been altered by the first running of the program so when the operating system wants to output a character it first performs our routine, then jumps to our old routine, which by then may have been overwritten, leading to a program crash.

Doubtless, by now I will have left many people behind so, before explaining the point of all this I will go through the program a step at a time. Lines 20 to 50 set up a parameter block as described in the User Guide for the SOUND command using an OSWORD call. 8 values are put in 8 locations using the byte indirection operator?. These make up 4 16 bit values stored in two's complement representation with the lower byte being stored first, as described in the User Guide. Line 60 looks at the output vector at &20E,&20F. Everytime the operating system wants to print something out it looks at this vector and jumps to the routine pointed to. Since we want to insert our own routine we need to know where to jump to afterwards to print out a character. In lines 170, 180 we alter the output vector to point to our routine — as easy as that, due to the BBC operating system.

The assembler in lines 90 to 150 is a fairly short routine but it introduces some new mnemonics to our vocabulary. We wish to insert our routine without effecting anything else by executing it. Since we do not have LOCAL variables in machine code the register values must be saved on entry and then restored at the end of the code. This can be done by pushing the values onto the stack at the start, and then pulling them off before leaving. PHA has the effect of pushing an eight bit value from the accumulator onto the stack. Once it is there it will stay there until it is pulled from the stack and it will not be effected by what goes onto the stack above it. TXA and TYA are instructions for transferring a byte from the index

registers. TXA:PHA therefore pushes the value of the X register onto the stack. Notice that Line 140 is the opposite of line 100, since the number at the top of the stack is always the last one pushed on so it is the first to be removed. Whatever happens between these two lines will now have no net effect on the register values on exit from the routine unless the stack is incorrectly manipulated (something to be avoided). In fact lines 110 to 130 are just a simple call to the SOUND routine with parameters set up in lines 20 to 50 and pitch adjusted according to the ASCII value of the character to be printed, in line 90.

Finally, for those OS 1.2, I present the following short routine (just in case anyone was getting worried that the Oric could do something that the BBC could not) which makes a sound when something is entered from the keyboard. In fact I think it would not need too much modification to turn it into a talking keyboard with the speech synthesiser (change line 20 to read PARAM%?0=&FF:PARAM%?1=&FF and line 30 to PARAM%?2=<word number>:PARAM%?3=0. *Take my advice though and don't bother, the din it produces is unbearable—Ed.*)

```

>LIST
 10 DIM PARAM% 8
 19 REM set up parameter block
 20 PARAM%?0=3:PARAM%?1=0
 30 PARAM%?2=&F1:PARAM%?3=&FF
 40 PARAM%?4=0:PARAM%?5=1
 50 PARAM%?6=1:PARAM%?7=0
 70 DIM P% 30
 80 C.CPIP
 89 \ save registers
 90 PHA:TXA:PHA:TYA:PHA
 99 \ set tone value
100 STY PARAM%+4
109 \ point to parameters
110 LDX#PARAM%AND255
120 LDY#PARAM%DIV256
129 \ call OSWORD for SOUND
130 LDA#7:JSR&FFF1
139 \ restore registers
140 PLA:TAY:PLA:TAX:PLA
150 RTS: ]
169 REM now link it in
170 ?&220=CPIP AND 255
180 ?&221=CPIP DIV 256

```

This makes use of the event handling routines outlined in the User Guide and can be enabled with \*FX14 (,2—Ed.) command. Notice the fact that a different vector — the event handler, is modified here, and the routine ends in an RTS. By placing the code for the routine at &DE0 you could easily leave it permanently, disabling it with \*FX13.

Do not worry if various aspects of the operating system have been glossed over, I intend to return to this at a later date, but I hope that you will now start to experiment with adding your own routines to the few examples I have so far provided. You may be surprised how quickly you learn by your mistakes.

Nick Goodwin

## Prestel spot

“LASERBUG has now opened up its new magazine on Prestel. We will print full details about the new service in the next issue but all Prestel users can see it now by going to page 8008128 (8008 is ClubSpot 800, 128 is where our pages start.) The main index is on 8001280 and all the latest news can be found on 80081281. We also have a response frame available on 800812800.”

- \*FX117 Equivalent to CLOSE # 0 in BASIC Ian Porter
- \*FX136,x,y This does not read the light pen co-ordinates although it could be programmed to do so. It is in fact the equivalent of \*CODEx,y. This command jumps to a user machine code routine whose start address has been inserted at &200, &201 with x and y being put into the X and Y registers by the command. This address normally gives "Bad command" before returning to the main program. Values can be returned from the user routine either from the program or by using the USR function.  
Dr. Susans
- \*FX157,x,y This is the equivalent to BPUT # is BASIC where x is the channel number and y is the byte to be transferred  
Ian Porter
- \*FX160,x Read 0300,x-y/0301,x-y Colin Durbridge
- \*FX184,x Send x to video ULA at &FE20 Dr. Susans
- \*FX185,x Send x to video ULA at &FE21 Dr. Susans
- \*FX188,x x is the number of ADC channels being read  
Dr. Susans
- \*FX189,x x is the number of ADC channels in use  
Dr. Susans
- \*FX190,x Read/write ADC number of bits in ADC conversion. Stored at &24C. x=0 gives normal 12 bit conversion, x=8 gives 8 bit conversion. 12 bits will still be read as normal but only 8 bits are useful the other bits are random, so use ADVAL(a) AND &FF00 or ADVAL(a) DIV 256. 8 bit operation speeds up reading by more than 2.5 times.  
Dr. Susans
- \*FX192,x Load ACIA (6850) control register with x.  
Dr. Susans
- \*FX193,x Set the remaining length of the current flash period (in units of 20 milliseconds). x is stored at &251 and decrements to zero when the current flash period is terminated and the other flash colour displayed. x can be set to values (255 max.) greater than those set by the \*FX9, \*FX10 values, these only set (alternately) the start values at this address. The USR function can be used to read the length remaining of the current flash period. Dr. Susans
- \*FX196 Read or write auto repeat delay Dr. Susans
- \*FX197 Read or write auto repeat period Dr. Susans
- \*FX198,x This is equivalent to \*EXEC. All subsequent input will be taken from the file whose channel number is supplied in x until the end of the file is reached  
Ian Porter
- \*FX199,x This is equivalent to \*SPOOL. All subsequent output will be copied to the file whose channel number is supplied in x until the file is closed.  
Ian Porter
- \*FX216,x Copy to the keyboard register x characters stored starting at (&B01 + ?&2C9) i.e. from the KEY store. The contents of &2C9 will be incremented as each character is transferred. Dr. Susans

112 CALLS KNOWN — 44 TO GO. If you know any of the following \*FX calls:

119, 120, 121, 122, 143, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 181, 182, 183, 186, 187, 191, 201, 203, 204, 205, 206, 207, 208, 215, 217, 218, 221, 222, 223, 234, 238, 239, 240, 244, 250 and 251.

please let us know . . .

#Additional information on calls we have already mentioned.

## business spot

This month we were due to review a number of business software we have recently received. However we have made arrangements to obtain a large number of new pieces of software and so rather than have two reviews, we will be having one large feature next month.

If you would like to get in touch with other local users but do not want to get involved in the organisations of a local group, try looking in the list below for some contacts. If you would like to be put on this list, please write to us at the usual LASERBUG address and mark the envelope Contacts.

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London W.1.

In the user guide \*FX19 is described as a function that "causes the machine to wait until the start of the next frame of display for animation". In our 'The Complete \*FX List' printed last month we described the command as "waits for the television field synchronization pulse for next frame for use with animation". What does all this really mean? What use is the command? Well, if you use graphics at all on the computer then some time or the other you will need this command.

The best way to demonstrate what the \*FX19 call does is with of course an example. Enter the following program:

```

L.
10 REM Program 1 without *FX19
20 MODE4
30 VDU5
40 FORX%=0TO1280STEP2
50 GCOLOR,1:MOVEX%,512:PRINT"*"
60 GCOLOR,0:MOVEX%,512:PRINT"*"
70 SOUND&10,-15,3,1
80 NEXT
90 VDU4
  
```

This should make the star move slowly across the screen. The only problem is that the star will be moving jumpily and might well have "waves" of black moving over it. Now try amending the program to this:

```

L.
10 REM Program 2 with *FX19
20 MODE4
30 VDU5
40 FORX%=0TO1280STEP2
50 *FX19
60 GCOLOR,1:MOVEX%,512:PRINT"*"
70 *FX19
80 GCOLOR,0:MOVEX%,512:PRINT"*"
90 SOUND&10,-15,3,1
100 NEXT
110 VDU4
  
```

By just adding those two extra lines the star moves smoothly without any hitches at all. Simple! This type of use of \*FX19 was used in the Bug program (which should be in this issue??). We won't bore you by going into the ins and outs of why this works, just be happy that it does!!!

Never satisfied, lets look at a completely different case where \*FX19 could be used:

```

L.
10 REM Program 3 without *FX19
20 MODE4
30 VDU29,640:512:
40 FORX%=0TO345STEP15
50 MOVE0,0
60 DRAW$INRAD(X%)*512,COSRAD(X%)*512
70 PLOT85,SINRAD(X%+15)*512,COSRAD(X%+15)*512
80 NEXT
90 VDU29,0:0:
100 REPEAT
110 VDU19,1,1,0:0:
120 VDU19,1,4,0:0:
130 UNTILO
  
```

This will put a circle on the screen and attempt to change it's colour from blue to red and from red to blue repeatedly. What happens? Well, instead of a smooth transition from one colour to the next all that happens is bands of alternate red and blue appear moving down the shape. Oh dear! \*FX19 however comes to our rescue:

```

L.
10 REM Program 4 with *FX19
  
```

```

20 MODE4
30 VDU29,640;512;
40 FORXZ=0TO345STEP15
50 MOVE0,0
60 DRAWSINRAD(XZ)*512,COSRAD(XZ)*512
70 PLOT85,SINRAD(XZ+15)*512,COSRAD(XZ+15)*512
80 NEXT
90 VDU29,0;0;
100 REPEAT
110 *FX19
120 VDU19,1,1,0;0;
130 *FX19
140 VDU19,1,4,0;0;
150 UNTILO

```

This kind of problem would appear on the Strobe program (which should also be in this issue?) if it wasn't for the \*FX19. As a point of interest when using the \*FX19 and the fourth program mixing the red and blue of course gives cyan. That is how the colours other than red, green and blue are made — by mixing.

So remember, if at any time you have problems when producing some kind of graphical display cast your mind back to this article and see if \*FX19 will help.

Paul Barbour

## softspot - strobe

How much does a strobe light cost for a science lab now? I must admit that I don't know the figure but I'm sure it's more than nothing, that's how much one will cost if you type in the program below. This will enable you to use your computer's screen as a strobe with flash rates varying between 1 to 100 a second. You also start the initial ignition to enable accurate timing to be carried out. Instead of starting the flash by pressing space, with your own hardware you could easily link it in to a switch via the A/D port. Because of the speed of BASIC you loose between 2 and 4 hundredths of a second between each flash and so the timings are never 100% accurate. The program is only suitable for the 1.2 OS as the \*FX19 command is not available on the 0.1 and without it, the flash rates obtained in the program would not be possible.

You should be warned that if a strobe is used in front of people who suffer from epilepsy or fits that the high flash rates could bring on an attack.

```

>L.
10 REM STROBE LIGHT
20 REM by Paul Barbour
30 :
40 REM 22/5/83
50 :
60 REM Version 1.0
70 :
80 REM Takes up 0.82k memory
90 :
100 REM Requires OS 1.2
110 :
120 REM Written on OS 1.2
130 :
140 REM (c) LASERBUG 1983
150 :
160 :::::
170 :
180
190 REM !!!!! !!!!! !!!!!
200
210 REM This program should

```

```

220 REM not be used in front
230 REM of people who suffer
240 REM from Epilepsy or fits
250 REM as the high flash
260 REM rates possible in the
270 REM program could cause
280 REM an attack
290 :
300 REM !!!!! !!!!! !!!!!
310 :
320 ONERRORMODE7:END
330 MODE7
340 PRINT"STROBE LIGHT"
350 PRINT"======"
360 PRINT"How many ignitions per second (1-100)"
370 INPUT"? *TZ
380 IFTX<10RTZ>100THENPRINT"Out Of Range"? ";:GOTO
390 TZ=100/TZ
400 MODE5
410 VDU23,1,0;0;0;0;
420 PRINT"PRESS SPACE TO START"" FIRST IGNITION"
430 REPEATAS=GET$:UNTILAS=""
440 CLS:GOTO460
450 TIME=0:REPEATUNTILTIME=TZ
460 *FX19
470 VDU19,0,7,0;0;
480 *FX19
490 VDU19,0;0;0;
500 GOTO450

```

## softspot - bug

Hasn't your BBC Micro served you well since you had it? If it wanted something wouldn't you do it? Well, the time has come - your BBC Micro needs you. Inside your computers memory chips there is a little bug biting away at it's bytes (apologies for the pun - Ed.) As you know, the BBC Micro's memory chips are soldered onto the PCB so you wouldn't want to replace them, would you? There is only one answer - you must guide the bug out of the chip avoiding areas of high memory, moving it only over 1 or 2 byte blocks where possible.

HELP ME !!!

-----

Inside my circuitry there is a small bug eating my bytes. Try to get the bug out of my RAM chips using the least amount of memory.

```

| is 1 byte
| is 2 bytes
| is 3 bytes
■ is 4 bytes

```

```

X moves the bug right
Z moves the bug left
: moves the bug up
/ moves the bug down

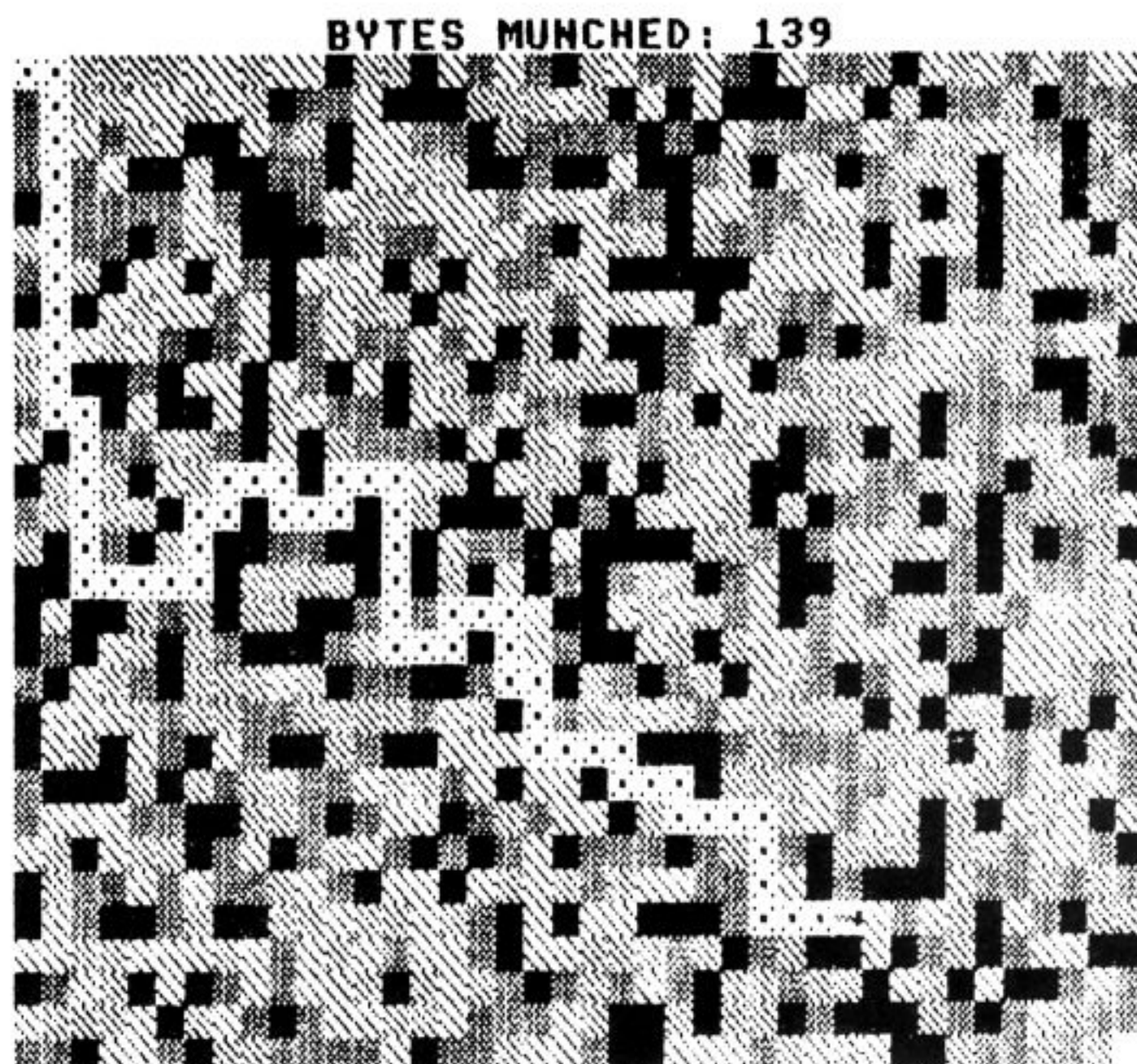
```

Flashing ■ is the exit

Press RETURN to attempt to save me...

Using the ZX/\* keys guide the small bug out of the chip. The game uses MODE1 and includes a high score chart. The program

was written on OS 1.2 but could be altered to run on the 0.1 by following the alterations detailed below. It is suitable for disk based systems (i.e. there is no need to change PAGE)



- \* Change 220 from VDU23,1,0... to VDU23;8202;...
- \* Change the character definitions in lines 420-500 from ASCII 128 - 136 to 224 - 232
- \* Change the 127 in line 730 to 223
- \* Change CHR\$133 in line 730 to CHR\$229
- \* Change CHR\$128 in line 810 to CHR\$224
- \* Change the 135 in line 960 to 231
- \* Change the 133 in line 970 to 229
- \* Change the 132 in line 980 to 228
- \* Change the 134 in line 990 to 230
- \* Change the 136 in line 1060 to 232
- \* Delete the \*FX19 in lines 1640 and 1660
- \* Delete lines 1950 and 1980

```
L.
10 REM      BUG
20 REM    by Paul Barbour
30 :
40 REM      22/5/83
50 :
60 REM      Version 1.0
70 :
80 REM Takes up 3.86k memory
90 :
100 REM Requires 32k + OS 1.2
110 :
120 REM    Written on OS 1.2
130 :
140 REM    (C) LASERBUG 1983
150 :
160      :::::
170 :
180 DIMH%(9),H$(10)
190 PROCset_up1
200 *TV255,1
210 MODE7:PROCintro1
220 MODE1:VDU23,1,0;0;0;0;
230 PROCintro2
240 CLS
250 PROCset_up2
```

```
260 PROCscreen
270 REPEAT
280   PROCget_move
290   PROCscore
300   UNTILFNout
310 CLS
320 PROCrun
330 PROCthanks
340 PROCtable
350 score%=0
360 GOTO220
370 END
380 :
390      :::::
400 :
410 DEFPROCset_up1
420 VDU23,128,-1,-1,-1,-1,-1,-1,-1
430 VDU23,129,170,85,170,85,170,85,170,85
440 VDU23,130,146,73,36,146,73,36,146,73
450 VDU23,131,136,68,34,17,136,68,34,17
460 VDU23,132,60,60,8,16,8,16,8,16
470 VDU23,133,0,0,3,171,87,3,0,0
480 VDU23,134,16,8,16,8,16,8,60,60
490 VDU23,135,0,0,192,234,213,192,0,0
500 VDU23,136,0,66,0,24,24,0,66,0
510 FORtable%=0TO9
520   H%(table%)=200
530   H$(table%)="LASERBUG"
540 NEXT
550 ENDPROC
560 :
570 DEFPROCset_up2
580 VDU19,1;0;0;19,2,9,0;0;
590 *FX9,1
600 *FX10,1
610 wormx%=0:wormy%=1
620 newx%=0:newy%=0
630 osascii=&FFE3:osbyte=&FFF4
640 ENDPROC
650 :
660 DEFPROCscreen
670 COLOUR2
680 PRINTTAB(2,0);"TRANSPORTING YOU INTO THE RAM CHIP
... "
690 COLOUR3
700 VDU19,3;0;0;
710 TIME=0
720 PRINT
730 FORarea%=1TO(40*30):A%=RND(4)+127:CALLosascii
740   IFarea%=760THENVDU19,0,1,0;0;19,3,1,0;0;:SOUND2
,-15,100,4
750   SOUND&11,-10,area%/5,1:NEXT
760 VDU19,3,2,0;0;
770 SOUND2,-15,100,4
780 COLOUR1
790 PRINTTAB(0,1);CHR$133
800 COLOUR2
810 PRINTTAB(39,30);CHR$128;
820 TIME=0:REPEATUNTILTIME=100
830 FORsound%=1TO10:SOUND1,-15,100,2
840   TIME=0:REPEATUNTILTIME=25:NEXT
```

```

850 PRINTTAB(12,0)"BYTES MUNCHEd: 0"
860 ENDPROC
870 :
880 DEFPROCget_move
890 newx%=wormx%:newy%=wormy%
900 *FX15,1
910 REPEATmove$=GET$:UNTILINSTR("ZX:/zx*?",move$)
920 IFmove$="z"THENmove$="Z"
930 IFmove$="x"THENmove$="X"
940 IFmove$="*"THENmove$=":"
950 IFmove$="?"THENmove$="/"
960 IFmove$="Z"THENnewx%=wormx%-1:char%=135
970 IFmove$="X"THENnewx%=wormx%+1:char%=133
980 IFmove$=":"THENnewy%=wormy%-1:char%=132
990 IFmove$="/"THENnewy%=wormy%+1:char%=134
1000 IF(newy%<1)OR(newy%>30)THEN900
1010 IF(newx%<0)OR(newx%>39)THEN900
1020 ENDPROC
1030 :
1040 DEFPROCscore
1050 PRINTTAB(newx%,newy%);A%=135:A%=(USROsbyte)AND&
FFFF)DIV&100
1060 IFA%=136THEN1130
1070 byte%=(5-(A%-127))
1080 score%=score%+byte%
1090 SOUND&13,-10,A%*64,4
1100 score%="BYTES MUNCHEd: "+STR$(score%)
1110 COLOUR2
1120 PRINTTAB(((40-LEN(score%))/2),0);score$
1130 COLOUR1
1140 PRINTTAB(wormx%,wormy%);CHR$136
1150 wormx%=newx%:wormy%=newy%
1160 PRINTTAB(wormx%,wormy%);CHR$char%
1170 ENDPROC
1180 :
1190 DEFFNout
1200 IFwormx%=39ANDwormy%=30THEN=TRUE:ELSE=FALSE
1210 :
1220 DEFPROCintro1
1230 PRINT"BBC Computer 32K"
1240 PRINT"BASIC"
1250 PRINT">RUN"
1260 PRINT"Bug error"
1270 PRINT"Bad program"
1280 PRINT"Press SPACE To Continue..."
1290 PRINT">";
1300 REPEATUNTILGET$=" "
1310 ENDPROC
1320 :
1330 DEFPROCintro2
1340 COLOUR2
1350 PRINTTAB(16)"HELP ME !!!"
1360 PRINT"STRING$(40,"-")
1370 VDU19,3,6,0,0,0
1380 COLOUR3
1390 PRINT" Inside my circuitry there is a small"
1400 PRINT" bug eating my bytes. Try to get"
1410 PRINT" the bug out of my RAM chips using the"
1420 PRINTTAB(8);"least amount of memory."
1430 VDU19,1,5,0,0,0
1440 COLOUR1
1450 PRINTTAB(14)CHR$131;" is 1 byte"
1460 PRINTTAB(14)CHR$130;" is 2 bytes"
1470 PRINTTAB(14)CHR$129;" is 3 bytes"
1480 PRINTTAB(14)CHR$128;" is 4 bytes"
1490 PRINTTAB(10)"X moves the bug right"
1500 PRINTTAB(10)"Z moves the bug left"
1510 PRINTTAB(10)": moves the bug up"
1520 PRINTTAB(10)"/ moves the bug down"
1530 PRINTTAB(9)"Flashing ";CHR$128;" is the exit"
1540 COLOUR3
1550 PRINT" Press RETURN to attempt to save me..."
1560 REPEATUNTILGET=13
1570 ENDPROC
1580 :
1590 DEFPROCrun
1600 VDU5
1610 X%=0:Y%=1024
1620 REPEAT
1630 SOUND&10,-(15-(X%/66)),1,1
1640 *FX19
1650 GCOL0,1:MOVEX%,Y%;PRINTCHR$133
1660 *FX19
1670 GCOL0,0:MOVEX%,Y%;PRINTCHR$133
1680 X%=X%+12.8:Y%=Y%-10.24
1690 UNTILX%>=1280 OR Y%<=0
1700 VDU4
1710 ENDPROC
1720 :
1730 DEFPROCthanks
1740 VDU20
1750 COLOUR2
1760 PRINT"THANK-YOU !!! YOU HAVE SAVED MY MEMORY"
1770 comment$="USING "+STR$(score%)+ " BYTES"
1780 PRINTTAB((40-LEN(comment%))/2);comment$
1790 PRINT"STRING$(40,"-")
1800 IFScore%<HZ(9)THENPROCnew_score
1810 ENDPROC
1820 :
1830 DEFPROCnew_score
1840 pointer%=-1
1850 REPEATpointer%=pointer%+1
1860 UNTILpointer%=9 OR score%<HZ(pointer%)
1870 FORreplace%=9TO(pointer%+1)STEP-1
1880 H$(replace%)=H$(replace%-1)
1890 H$(repiace%)=H$(replace%-1)
1900 NEXT
1910 VDU19,3,6,0;0;19,1,5,0;0;
1920 COLOUR3
1930 PRINT"Congratulations, You've Set a New High"?'T
AB(17)"Score"
1940 PRINTTAB(9)"Please Enter Your Name:"
1950 VDU23,1,1;0;0;0;
1960 *FX15,1
1970 PRINT"> ";:COLOUR1:INPUT"H$(pointer%)
1980 VDU23,1,0;0;0;0;
1990 H$(pointer%)=score%
2000 ENDPROC
2010 :
2020 DEFPROCtable

```



```

2030 COLOUR1
2040 PRINT''
2050 FORtable%=0TO9
2060 print$=STR$(table%+1)+". "+RIGHT$(H$(table%),20
)+ " - "+STR$(H$(table%))
2070 PRINTTAB((40-LEN(print$))/2);print$
2080 NEXT
2090 COLOUR3
2100 PRINT'TAB(7)"Press SPACE to continue..."
2110 REPEATUNTILGET$=" "
2120 ENDPROC

```

## softspot - hungarian rings

```

L.
10 REM RINGS (C) ARJEN KAEMINGK 1983
20 REM VERSION 1 23/2/83
30 ONERRORGOTO1200
40 MODE7
50 *TV255
60 PROCINIT
70 PROCINSTR
80 MODE2
90 PROCDISPL
100 VDU5
110 PROCPRINTL
120 PROCPRINTR
130 REPEAT
140 IFINKEY(-98):PROCNEXTLL
150 IFINKEY(-67):PROCNEXTLR
160 IFINKEY(-102):PROCNEXTRR
170 IFINKEY(-86):PROCNEXTRL
180 UNTILFALSE
190 END
200 DEFPROCINIT
210 DIMX1%(20),Y1%(20),C1%(20),X2%(20),Y2%(20),C2%(20
),C3%(20),C4%(20)
220 CLS
230 VDU23,224,0,0,24,60,126,126,255,255
240 VDU23,225,255,255,126,126,60,24,0,0
250 A$=CHR$224+CHR$10+CHR$8+CHR$225
260 FORI%=0TO19
270 READX1%(I%),Y1%(I%),C1%(I%),C2%(I%)
280 NEXT
290 DATA100,360,4,1
300 DATA110,276,4,1
310 DATA155,204,4,1
320 DATA220,148,4,1
330 DATA305,112,4,1
340 DATA395,100,4,3
350 DATA490,112,1,3
360 DATA575,148,1,3
370 DATA640,204,1,3
380 DATA685,276,1,3
390 DATA695,356,1,3
400 DATA685,440,2,3
410 DATA640,512,2,3
420 DATA575,568,2,3
430 DATA490,604,2,3
440 DATA400,616,2,2
450 DATA305,604,4,2
460 DATA220,568,4,2
470 DATA155,512,4,2
480 DATA110,440,4,2
490 FORI%=0TO19
500 X2%(I%)=X1%(I%)+350:Y2%(I%)=Y1%(I%)
510 NEXT
520 A=1
530 ENDPROC
540 DEFPROCINSTR
550 PRINTTAB(8,1);CHR$129;CHR$141;"R I N G S"TAB
(8,2);CHR$129;CHR$141;"R I N G S"
560 PRINT''''Use:-''''Z-key to turn left ring anti-c
lockwise''X-key to turn left ring clockwise"
570 PRINT"N-key to turn right ring anti-clockwise""M
-key to turn right ring clockwise"
580 X=INKEY(1000)
590 CLS
600 ENDPROC
610 DEFPROCNEXTLL
620 IFA=1 C1%(7)=C2%(3):C1%(13)=C2%(17):A=0
630 FORI%=0TO19
640 C3%(I%+1)=C1%(I%)
650 NEXT
660 FORI%=0TO19
670 C1%(I%)=C3%(I%)
680 NEXT
690 C1%(0)=C3%(20)
700 PROCPRINTL
710 ENDPROC
720 DEFPROCPRINTL
730 FORI%=0TO19
740 GCOLOR,C1%(I%):MOVEX1%(I%),Y1%(I%):PRINTA$
750 NEXT
760 ENDPROC
770 DEFPROCNEXTLR
780 IFA=1 C1%(7)=C2%(3):C1%(13)=C2%(17):A=0
790 C1%(20)=C1%(0)
800 FORI%=1TO20
810 C3%(I%-1)=C1%(I%)
820 NEXT
830 FORI%=0TO19
840 C1%(I%)=C3%(I%)
850 NEXT
860 PROCPRINTL
870 ENDPROC
880 DEFPROCNEXTRL
890 IFA=0 C2%(3)=C1%(7):C2%(17)=C1%(13):A=1
900 FORI%=0TO19
910 C4%(I%+1)=C2%(I%)
920 NEXT
930 FORI%=0TO19
940 C2%(I%)=C4%(I%)
950 NEXT
960 C2%(0)=C4%(20)
970 PROCPRINTR
980 ENDPROC
990 DEFPROCPRINTR
1000 FORI%=0TO19
1010 GCOLOR,C2%(I%):MOVEX2%(I%),Y2%(I%):PRINTA$

```

```

1020 NEXT
1030 ENDPROC
1040 DEFPROCNEXTRR
1050 IFA=0 C2%(3)=C1%(7):C2%(17)=C1%(13):A=1
1060 C2%(20)=C2%(0)
1070 FORI%=1TO20
1080 C4%(I%-1)=C2%(I%)
1090 NEXT
1100 FORI%=0TO19
1110 C2%(I%)=C4%(I%)
1120 NEXT
1130 PROCPRINTR
1140 ENDPROC
1150 DEFPROCDISPL
1160 VDU28,1,8,17,0:COLOUR134:CLS
1170 COLOUR5
1180 PRINTTAB(2,4)"R I N G S"
1190 ENDPROC
1200 MODE7
1210 IFERR<>17 THEN REPORT:PRINT" at line ":ERL
1220 END

```

## bits & bobs - overlays

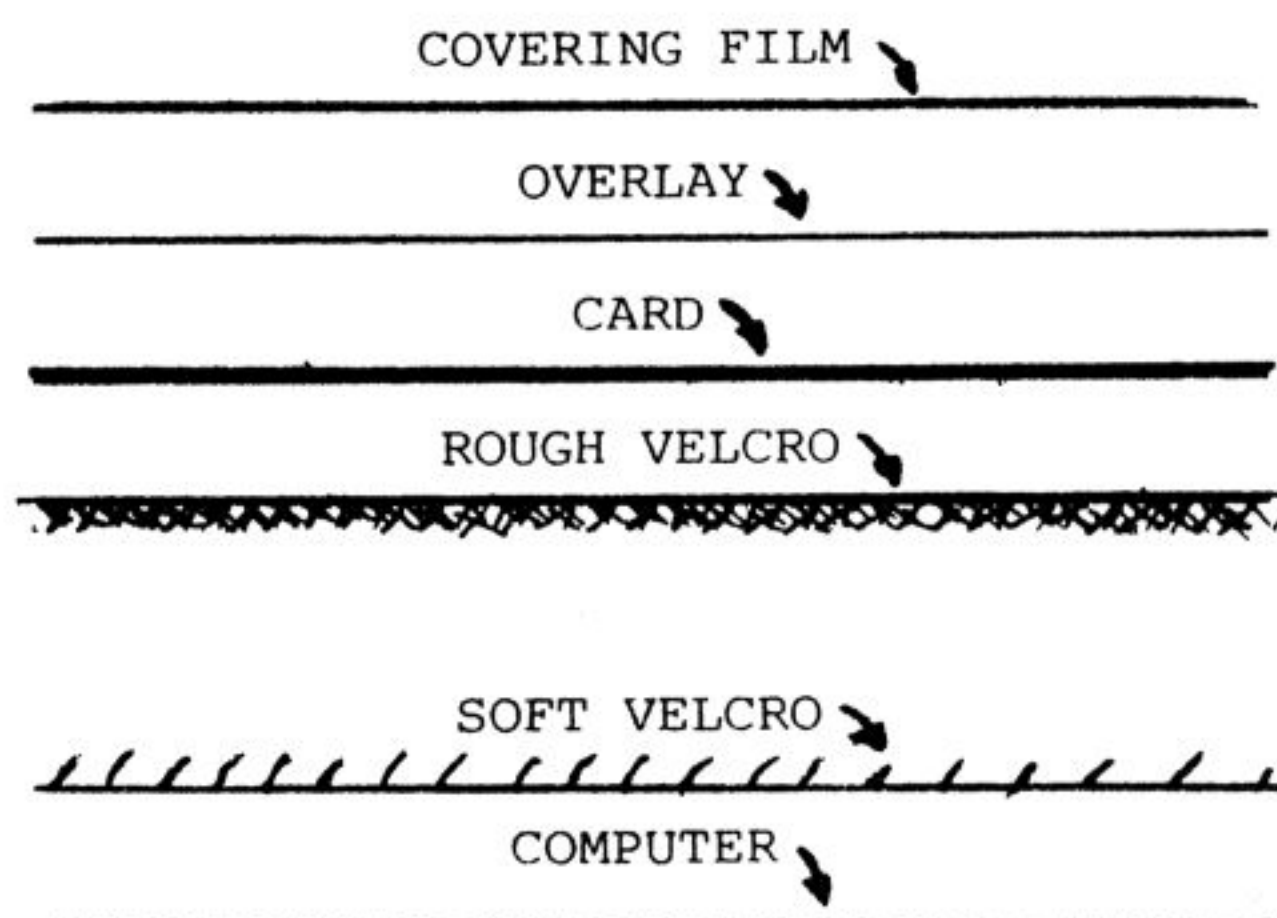
If you have bought the Micronet adaptor, you will have an overlay for the function keys. If you have Wordwise you might have an overlay. If you buy View you might have an overlay. In fact, with the function keys being so useful, many programs make use of them - most including an overlay with the package. If you only have one such program then fine - if you have more than one then you will have to keep lifting up the plastic strip at the top, taking the old overlay out and putting a new one in! Not any more if you try the LASERBUG method: You will need:

1 Packet of Stick'n Stick Velcro (black/20mm wide) - 79p in most DIY shops

1 Packet of Self Adhesive Covering Film - 70p from W H Smith

1 Sheet of thin card

The idea is firstly to stick the overlay you get with your program to the card. Then cover it in the self-adhesive covering film for added protection. Cut a strip of the soft sided velcro approximately 180mm long (i.e. as the width of the function keys) and stick this on the plastic strip. Then, cut a similar strip of the rough velcro and fasten that to the back of the overlay. Now, when using your program you can fasten the overlay onto the computer. After you have finished the overlay can be easily taken off or replaced with a similar one.



You will probably need a new packet of velcro for each overlay but a sheet of card should last you two or three and the covering film for 50 or more!

It's the simple ideas that are best!!!

## printer review

I have been using the GP250, Seikosha's updated version of the GP100 dot matrix printer, for several months and have so far found it reliable and very useful. Although not of letter quality, printing is very legible, well suited to listing programs or most graphics work. Characters are printed on an eight by six size dot matrix, allowing letters with tails below the line to be printed as such. The entire character set is printed below with the ASCII codes in hex:

20		40	Q	60	\
21	!	41	R	61	a
22	"	42	B	62	b
23	#	43	C	63	c
24	\$	44	D	64	d
25	%	45	E	65	e
26	&	46	F	66	f
27	'	47	G	67	g
28	(	48	H	68	h
29	)	49	I	69	i
2A	*	4A	J	6A	j
2B	+	4B	K	6B	k
2C	,	4C	L	6C	l
2D	-	4D	M	6D	m
2E	.	4E	N	6E	n
2F	/	4F	O	6F	o
30	0	50	P	70	p
31	1	51	Q	71	q
32	2	52	R	72	r
33	3	53	S	73	s
34	4	54	T	74	t
35	5	55	U	75	u
36	6	56	V	76	v
37	7	57	W	77	w
38	8	58	X	78	x
39	9	59	Y	79	y
3A	:	5A	Z	7A	z
3B	;	5B	[	7B	{
3C	<	5C	\	7C	
3D	=	5D	]	7D	}
3E	>	5E	^	7E	~
3F	?	5F	_	7F	

Graphics printing is achieved by sending a series of bytes to the printer when in graphics mode. Each bit controls one of a column of eight dots, making it very easy to have full dot-addressable graphics (unlike most cheap printers) up to 480 columns. We have, as is usual with printer reviews in LASERBUG, written a screen dump program. This works in MODE4:

```

>LIST
4 :
5 REM MODE 4 Screen Dump for Seikosha GP-250X
6 :
10 REM 0sbyte 132 reads screen start
20 A%=132 : S%=USR%FFF4
30 start%=(S%AND%FFFF00)/%100
40 REM Screen carries on to &8000
50 screen%=&8000-start%
60 REM Address of byte in top left
70 REM from 6845 chip used for scrolling
80 ?%FE00=12 : S%=256*?%FE01
90 ?%FE00=13 : char%=(S%+?%FE01)*8
100 REM Each character is 8 bytes long
110 prlin%=32*8:REM bytes per printed line
120 row%=40*8:REM bytes per character row

```

```

130 REM Start printing from top right
140 char%=char%+row%-8
150 REM Set up the printer line spacing
160 VDU2,1,27,1,76,1,2
170 FOR col%=0TO39
180   top%=char%
190   REM Prepare for a line of graphics
200   VDU1,13,1,27,1,71,1,prlin%DIV256,1,prlin%AND255
210   FOR line%=0TO31
220     FOR byte1=0TO7
230       VDU 1,byte1,top%
240       NEXT byte1
250       top1=top%+row%
260       IF top% >= 255 THEN top%=top%-256
270       NEXT line%
280   char%=char%+8
290   NEXT col%
300 REM ALL done
310 VDU3 END

```

Facilities only found on more expensive printers have found their way onto the GP250, controlled by characters sent to the printer. Double height and double width characters can be printed, line spacing and character spacing on a line can also be under program control. If you wish to do so you can define your own characters, perhaps for your own titles. You can even define a block of characters to be called up by a single code.

Features you may want in a printer but missing from the GP250 are mainly those which provide better quality for letter writing, such as italic printing and over-striking to fill in the gaps between the dots. Characters are set up in a buffer 480 dots wide and eight deep before printing. This explains why the available features are so flexible and why those that are not probably will not become so. It also means that printing occurs a line at a time faster than most printers in this price range.

Mechanically, the printer is adequate and it appears well finished. The tractor feed is fairly even but no facilities are present for friction feed. Printing is fairly noisy, though no worse than most, occurring at a speed of about a second per line or less if the lines are short as in a program listing. Interfaces provided as standard are Centronics parallel and RS232 giving the widest possible range of connections - a feature that may be popular in club use where several people with several different computers need only to have leads made up to make use of the printer.

The documentation, provided as a 32 page booklet, is barely adequate but much better than anything I have seen with other cheap printers. Careful study is needed if you are to get the best of all the features available, especially if you wish to incorporate a series of control codes. All printers have idiosyncracies; this one has fewer than most. If you are saving up for a GP100 or any other printer under £200 I would advise you to see the GP250 first. It is worth the extra money, giving better value than virtually any other printer on the market. If you want letter quality though, you may be better off waiting for the Epson RX-80 but it will cost a lot more.

Nick Goodwin

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Reproduction of some of the pictures and computer print-out are not up to standard. We apologise for this temporary reduction in quality and hope that it does not spoil your enjoyment of the magazine too much.

## oddsport

This hint shows two things, one is how many people and companies that were involved in the design of the BBC micro. Secondly, it shows how to make sure everyone gets the credit due, without showing off. Some might consider it the modern version of "cave-paintings".

One does however need a machine-code monitor for the BBC. It must be written entirely in machine-code, and not make use of Basic. I have used MEDMON from Microtrol Engineering Design Ltd of Leicester, but any similar product could be used.

Many owners of the BBC micro have now acquired the 1.2 version of the MOS ROM. Before throwing away the old O.I., have a closer look at it. WARNING: Make sure You Know what You are doing, this is not intended for inexperienced hackers! Start by installing the old ROM in one of the empty ROM sockets. Load and run the machine-code monitor. Change the contents of address FE30 (hex) to select the old MOS ROM. The far left socket is selected with FC, the far right with FF. (The two others of course with FD and FE).

As most people who have read this far will know, page FC, FD and FE is used for memory-mapped I/O. The MOS ROM is therefore not selected when accessing these addresses. And inspecting them gives no clue to what is hidden there. When the ROM is placed in one of the empty ROM locations however, the content can be easily read. Page FC, FD and FE now become BC, BD and BE, and an ASCII dump of these pages will reveal it all. That is, with the old MOS ROM selected, View (or similar command) from address BC00 to BF00 with ASCII printout of the "code" that is stored there. It is an impressive list!

It is interesting to note the changes from 0.1 to the new 1.2 ROM.

NB: Both CC and HH is there, but contrary to popular belief, KILROY WAS NOT THERE! Who could have guessed? And where is the BBC?!?

Morten Christiansen

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Articles and programs are always welcome. Please make sure that your work is original and has not been copied from elsewhere nor submitted to any other organisation. Work will be paid for. All contributions should preferably be submitted as a View, Wordwise or Wordsworth text files on either cassette (copies at both 1200 and 300 baud please). Alternatively typed or computer printed copy if acceptable but please ensure that you use double spacing and have at least a 1" margin. Hand written material is subject to delay and error. All programs longer than 10 lines should be submitted either on disk (either 40 or 80 tracks) or cassette (both 1200 and 300 baud please). If listings are supplied these should be done with LIST07 and WIDTH34 for 80-column listings (WIDTH55 for 132-columns). The first lines of the program should be REMed in the normal LASERBUG standard.

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DC01 BBC Micro PVC Cover .....	£4.00 + 20p P&P	DC02 Microvitec PVC Cover .....	£5.00 + 30p P&P
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### BACK COPIES

Missed out on a copy of LASERBUG? If so then use our back copy service and catch up on your reading. We have stocks on all magazines. A complete index was printed in Issue 11 but briefly:

BC01 Issue 1 (16 pages)	Teletext Graphics, User Definable Characters, Hardreview, Oddspot
BC02 Issue 2 (16 pages)	Sound/Envelope, *FX Part I, Teletext Part II, User Definable Keys, Pontoon
BC03 Issue 3 (24 pages)	Programmers Corner, *FX Part II, Epson Screen Dump, Softreview, Telesoftware
BC04 Issue 4 (20 pages)	Hardspot, What Printer?, Bookreview, Oddspot, Pixel Power, Moving Things
BC05 Issue 5 (32 pages)	Wordprocessor, Machine Code, Disassembler, Seikosha Screen Dump, RGB Conversions
BC06 Issue 6 (24 pages)	Software Protection Part I, Puzzle Program, How To Use Joysticks, Queryspot
BC07 Issue 7 (24 pages)	Software Protection Part II, Alphabet Tester, Questionnaire Results, Club Reports
BC08 Issue 8 (24 pages)	Memory Analyser, Assembler Programming On The BBC Micro Part I, Diskspot
BC09 Issue 9 (24 pages)	Wallball, ADC Corner, Make The Most Out Of Sound, Grand Prix, Nine Dice
BC10 Issue 10 (24 pages)	Tape Recorder Talk, Instant Memory Scan, Software Protection Part III
BC11 Issue 11 (28 pages)	Micronet Review, Epson In Depth, Arcade Game High Scores, Year 1 Index
BC12 Issue 12 (24 pages)	The Complete *FX List, Mactor, What To Do With Your 1.2, One Armed Bandit, Consumer Spot

BC01 is a reprint and costs £1.60 + 20p P&P. All other backcopies (BC02-BC12) cost £1.25 + 20p P&P.

### BOOKS

Interface have kindly allowed us to offer you a discount on both books they sell for the BBC Micro. The first is Making The Most Of Your BBC Micro by Tim Hartnell and the other is the BBC Micro Revealed by Jeremy Ruston. Both books have been reviewed in LASERBUG.

IN01 Let Your BBC Micro Teach You To Program by Tim Hartnell .....	£5.50 + 40p P&P
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### 1.2 ROMs

MEMBERS ONLY. If you are prepared to upgrade your computer yourself, LASERBUG can supply you with 1.2 ROMs for only £5.50 + postage – the cheapest price anywhere. They come with full fitting instructions and require no soldering. If you fit the chip and your computer doesn't work properly afterwards you can take your micro to the local Acorn dealer and he will check it over for you for the fee of £6.90. If the chip is found to be faulty you will not be charged but if you have damaged your computer the dealer will fix it but charge you for the repair at normal rates. We cannot guarantee a delivery date as we are dependant on Acorn for supplies.

RM01 1.2 ROM and fitting instructions .....	£5.50 + 20p P&P
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### BINDERS

Need something to hold your valuable LASERBUGs in? If so then purchase a LASERBUG binder. Each binder holds 12 issues and comes with the LASERBUG logo attractively printed on the front.

BD01 LASERBUG Binder .....	£4.00 + £1.00 P&P
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CODE	DESCRIPTION	PRICE	P&P
SUB TOTAL			
TOTAL			

NAME ..... ADDRESS .....

MEMBERSHIP NUMBER ..... DATE .....

**ALL ITEMS NORMALLY EX STOCK PLEASE ALLOW 7 DAYS FOR DELIVERY \***

\* Allow 4-6 weeks for 1.2 ROMs

**THIS ORDER FORM SUPERCEDES ALL OTHERS**

If you run out of room or do not want to cut up your LASERBUG you may order on a separate piece of paper or take a photocopy of this form.