



**Issue 5 Oct '82**

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..... and lots more!



Well, it's October and you are actually reading the October issue of LASERBUG as I promised. Hopefully this confirms to you all that we 'are back on the straight and narrow.' It is the first time since issue 1 that an issue of LASERBUG has come out exactly on time and hopefully the last time that LASERBUG will suffer delays.

With regards to the delays you probably (?) saw the small 'news-item' in the 2nd September issue of Popular Computing Weekly (or PCW as they like to be called although I have always associated those initials with Personal Computer World) entitled "LASERBUG TACKLES ITS PROBLEMS" with a picture of Trevor and myself (not a very good one—I looked more like a convict than an Editor!) The overall picture was presented but I suppose I should correct them on a few points. Firstly, LASERBUG is no longer restricted to London and the South East. We are now a national user group (or even perhaps international as we have members in such places as Spain, Sweden, the Netherlands, Australia and Norway). Next they said we have 2000 members. This figure was actually given back in May (!!!) and is no-where near current. At present we do not intend to quote our membership figure each month as certain other people do. These will only be given very occasionally although all I will say is that our membership is very healthy. At the end of the article it was stated that LASERBUG does not have a phone. Both my home address/phone number are in Contacts Page/Meeting Place and as I work all day from home on LASERBUG this is the same thing should anyone need to contact us. Anyway, thanks to Pop. Comp. Weekly for explaining the situation.

The biggest event last month was the PCW Show at the Barbican—what a crush! A full review of the show appears elsewhere in this issue. For BBC Owners there were three main items that people seemed to be buying—joysticks, Acornsoft programs and the BBC Design pad set. The joysticks are extremely large but at a first glance look extremely good we will go into more detail about them next month after we have investigated them fully. Acornsoft predictably chose the show to be the launching place for their new software range. It is a pity that they chose to go in for making big money by delaying the launch until the show instead of sending the thousands of mail-order customers who have been waiting up to 2 months for their programs. After the delays with the actual micro you would have thought they'd put service first however that's Acorn for you. A review of Monsters appears on the Softreview page. I am trying to get the entire range to review through Acornsoft but trying to get through to anyone at Acorn is like banging your head against a brick wall. Wish me luck and I might have some success. The other thing people were walking around with was a little box with a £9 price tag on it. Inside was 1 empty binder with the BBC Logo on it, 1 symbol design binder with 100 sheets of little more than graph paper (an enlargement of p.396 from the manual), 1 screen layout binder with 100 sheets of paper which are a combination of p.493/4 from the manual and a flow chart binder with 100 sheets of standard flowchart paper. At a first glance this looks expensive for what it is but more on this pack next month.

One thing you may have noticed in the press is the problems we have been having with BEEBUG. For the uninitiated in the September issue of MicroComputer Printout was a letter from Sheridan Williams who alleged that LASERBUG "...are in fact run by a shop called 'Computers for All' and cannot represent their members in a truly independent way." This is in no way true and our formal reply to Mr. Williams letter appears elsewhere in LASERBUG as well as a reproduction of the letter in question. This states my view quite clearly. The situation has now been resolved I am pleased to say. An edited version of my reply appears in the October issue of MicroComputer Printout who started the whole matter.

Now for the bad news... Hands up all those of you who have bought software for your BBC Micro. If you are among those then I suggest you sit down for you are now presented with a choice—either get a new operating system for your computer (whenever it becomes available) and stand the risk of losing some of your programs or keep the old one and have an incomplete BASIC incapable of further ROMs, etc. The story is that a great deal of commercially available programs available will not work with the new operating system including so I have been told the entire Bug-Byte range who are arguably the largest independent software producers in the country. The exact reasons for the incompatibility I do not yet know but I have been told of a few examples like using ?216 as the

keyboard scan which doesn't work on the 1.0. And the solution—there isn't an easy one. If the program is one that can be easily listed and re-saved (i.e. there is no protection on it) then a sheet of corrections could be printed. Other than that I do not know what to suggest. Software houses are unlikely to offer a free replacement because of the cost involved but might offer a new version at say 1/2 price? Any software house that is willing to let us print modifications to their programs so they work on the new OS should get in touch—this would both save the companies concerned money and provide a happy alternative to owners. As we get more news on this topic I will let you know.

When the Computer Literacy project first started and the specifications of the BBC Micro were given, it was said that a speech synthesis chip would become available and instead of the American drone that can be found in games such as Speak and Spell it would sound like Richard Baker. Now, many months on, the chip is much nearer production. Instead of Richard Baker it will talk like Kenneth Kendall and retail at £29.95. The initial ROM will only be able to speak a limited number of words but later a second ROM (probably fitting in the slot in the keyboard) will be available allowing proper phonetic speech to be produced. The two new chips will open up a new era in computing—when your computer goes wrong and you start hurling abuse at it, it can reply back!!!

What radio station do you usually listen to—Radio 1? Capital Radio? If you just happen to be listening in the 2 metre band you might hear something that sounds remarkably like a BBC Micro program. If this happens your ears are not deceiving you—what you are picking up is Roger Greenwood (G6CNY) of Huddersfield, W. Yorks. swapping programs with his friends. He was telling me that this is something he does regularly over the air with his fellow radio hams and with great success.

What is happening with the new operating system I hear you all cry. At LASERBUG we have been getting reports as diverse as "yes, I've got it in ROM form" to "Acorn won't even have the chips back till the end of September." None of these or any other comments are official so your guess about what is happening is as good as mine. The most likely report I was given is that the chips were just about to be ROMed when another bug was found. Hence Acorn cancelled their order and it will be about mid-December until the chips even get back into the country. The only solid fact I know is that as yet I haven't got a 1.0. The prices as far as I can discover is £35 for the 1.0 in EPROM form (available now) and £15 for fitting the ROM version.

On p.436 of the User Guide in the middle details are given about an application note entitled "BBC Computer 1MHz bus"—have you ever tried to obtain a copy of it? My suggestion to you is don't even bother! If you go to Acorn as the manual suggests they say that they don't stock it and you should go to an Acorn dealer. If you then go to an Acorn dealer he will tell you that he doesn't stock it and suggest you try Acorn direct. Now that is what I call a Catch-22 situation. I have written to Acorn about the situation and will inform you of there reply (assuming everyone isn't on holiday).

Are you thinking of buying an RGB Monitor? If you are then probably you are talking of the Microvitec which is a 14" RGB and costs £300. Now supposing you wanted a 22" RGB—generally you would be looking at about £500 minimum. Opus Supplies of Kent are offering an uncased 22" RGB monitor for £100!!! Unfortunately this is a limited offer as Opus bought the complete manufacturer's stock and hence the low price. You can find out if there are any left on 01-464 5040/1598.

About a year ago now the first full specification of the BBC Micro was produced. Just inside the cover of this it was said that the next full specification would be available by 31st March 1982 and invited you to send in a large SAE with 20p in stamps on it. I, like a great deal of people I know, sent off faithfully my large envelope and to the best of my knowledge nothing of this sort was every produced. Have you ever wondered what happened to all those thousands of envelopes?

You might find it interesting to hear about the official Acorn dealer marketing policy. The Gospel according to Acorn is that dealers should buy the BBC Micro itself at the same price that you or I have to and sell it for absolutely no profit. The dealers in turn are offered normal profit margins on peripherals which is where hopefully they will make their



money. Reaction to this has been mixed. Most of the Acorn dealers are quite happy with the arrangement although a 'fiddle' is being operated by a couple. What they do is buy a readily available Model A, add the extra components necessary to make it up to a Model B and sell it at Model B prices for a small profit. Non-Acorn dealers are not too happy with the arrangements. To be able to sell BBC Micro's you need to be an Acorn dealer and hence stock other Acorn products. Most people are happy to sell the Beeb machine but are not too interested in the Atom which is a pity because it is a good little micro.

We end this month with a mention to the BBC's new range of Software. 9 programs are available all at the cost of £10. There are two packages from the Computer programme, two on games, three on graphics and sound, one on home finance and one on early learning. More details on these next month.

I've written more than enough this month for the Editorial and so I will end here. There is a lot of very useful information buried in this month's LASERBUG and I hope you have fun digesting it all.

Please address all correspondence to:

LASERBUG  
10 Dawley Ride,  
Colnbrook,  
Slough,  
Berks.,  
SL3 0QH

It helps us considerably when sorting the mail if, in the top left hand corner, you can write one word that describes what your letter is about i.e. PROGRAMS, MEMBERSHIPS, QUERIES, etc. We regret that we cannot reply to any letters that do not include an SAE.

Paul Barbour

Have you entered a program from LASERBUG and couldn't get it to work? The chances are it had an error in it and hence the need for this page.

All the errors in LASERBUG we know of to date are:

ISSUE 2

On page 13 it is said that all \*FX statements greater than 126 can only be used in assembly language. This is quite simply wrong as any call up to 255 can (which is all \*FX goes up to).

ISSUE 3

On pages 7/8 Trevor Sharples outlines the LASERBUG software standards. On the basis of both my own opinion and the many letters we have been getting these standards for LASERBUG must be altered:

2—The idea of variables starting with A and progressing alphabetically is not needed. The early letters (particularly integer variable) are very valuable for FOR loops particularly when operational speed is of importance. Generally except when using integer variables, variables should all be in lower case and describe what it contains. This makes debugging and understanding programs much easier. This can of course be ignored when space is valuable. The same applies to PROCedures names.

4—same as 2.

5—same as 2.

6—If you can help it do not use subroutines at all. PROCedures are much more powerful and useful and should be used wherever possible. The point on subroutines is invalid anyway. The BBC Micro's BASIC is such that whether the subroutine is at the beginning or end the access time is still the same.

7—This is really irrelevant as the BBC Micro automatically expands abbreviations.

On page 10 was three procedures that provided peeks and pokes. Unfortunately the PEEK one which was the most useful had an error in it. Listed below is all three procedures:

```
L.
1000 DEFPROCPEEK(P%)LOCALX,Y:X=PO
S:Y=VPOS:PROXY(P%):PRINTTAB(X%,Y%
):A%=135:PEEK=(USR(&FFF4)AND&FF00
)/&100:PRINTTAB(X,Y):ENDPROC
1010 DEFPROCPOKE(P%,C%)LOCALX,Y:X
=POS:Y=VPOS:PROXY(P%):PRINTTAB(X%
,Y%):CHR$(C%):PRINTTAB(X,Y):ENDPR
OC
1020 DEFPROXY(P%)X%=P%MOD40:Y%=P
%DIV40:ENDPROC
```

What happened to the artillery listing I have no idea? 5 sets of lines seem to have disappeared. After giving our printer a gentle kick (it has an Acorn sticker on it so that explains a lot) you need to add the following lines:

```
>L.86,93
86PRINTTAB(56,0)"Press RETURN t
o continue"
87null#=GET#
88REM ** Reset screen **
89VDU22,7:VDU23:8202:0:0:0:
90REM ** Instructions - 2 *
*
91PRINT" The only other piec
e of information"'"you must enter
is the velocity (or speedof the sh
ell."
```

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```

92PRINT"    100 is a good value
to start off""with but this must
be increased or""decreased accor-
ding to the strength and""directi-
on of the wind (which varies""as
the game progresses)"
93REM    ** 5 second delay **

>L.106,109
106PRINT"Wind direction "TAB(28)
STRING$(5,direction$)
107REM    ** Enter angle **
108PRINTCHR$(7)TAB(0,4)"Angle of
elevation "TAB(29);:INPUTangle
109REM    ** Error trapping **

>L.112,115
112PRINTCHR$(7)TAB(0,5)"Velocity
of shell "TAB(29);:INPUTvelocity

113REM    ** Error trapping **
114IFvelocity<=0ORvelocity>1000T
HENPRINTTAB(0,5)SPC(40):GOTO112
115ENDPROC

>L.144,152
144REM    ** Missile landed **
145REM    ** Increment scores a-
nd change wind **
146shot=shot+1:score=score-10000
:wind=wind+(RND(10)-5)
147ENDPROC
148DEFPROCthud
149REM    ** Produces a fading
sound **
150FORfade=-15TO-1
151SOUND1,fade,1,2
152NEXTfade

>L.166,172
166COLOUR128:COLOUR7
167REM    ** Restart ??? **
168reply$=GET$
169REM    ** Check reply **
170IFreply$="Y"THENCLEAR:GOTO16
171IFreply$="N"THENPROCreset
172REM    ** Error trapping **

```

In my article about the Spectrum I said that at present BBC BASIC is working at half speed. Jeremy Rushton informs me that this is not true. Incidentally did you see that Uncle Clive has now withdrawn the table completely from his adverts.

On page 19 I said that BEEBUG is produced monthly. There are in fact only 10 issues/year.

#### ISSUE 4

Line 10 of the Oddsport program is wrong. It should read:

```

L.
10*KEY10OLD:IMILL.IM

```

Note that the line has also been shortened from its original form.

This month's *Oddsport* is from Mr. P. Burke of Hitchin, Herts. See if you can guess what it will do before you run it.

#### LIST

```

10MODE2:VDU23;8202;0;0;0;
20A%=10:MOVE640,512
30FORs%=0TO1023STEP16
40GCOL0,A% MOD8
50FORx%=0TO360STEP90
60DRAWsinRAD(x%+A%)*s%+640,COSR
AD(x%+A%)*s%+512
70NEXT:A%=A%+11:NEXT
80C1=0:C2=3
90REPEATVDU19,C1 MOD8,C2 MOD8,0
,0,0
100C1=C1+1:C2=C2+1*RND(2):UNTIL I
NKEY(0)=32

```

If you have a short program (about 10 lines or less) that performs something "impressive" either using sound or graphics, please send it to us marking the envelope ODDSPOT.

Before we close *Oddsport* for this month try entering the following: single line below. This was discovered by Dr. D.E. Susans. Any suggestions as to why it happens?

#### LIST

```

10SOUND1,38,107,23:GOTO10

```

## printer review

This month we are going to review the Seikosha GP-100A/Acorn AP-100A printer. The printer itself is actually made by Seikosha (Seiko as in watches) but the Acorn version is just the GP with a different sticker on it. The GP-100A has a 10" wide carriage but a GP-80A version is available for about £10 less which only has an 8" wide one. Considering the difficulty you will experience trying to find 8" wide paper it is more than worth paying the extra for the convenience.

We were also to review the Amber printer this month. Amber Controls promised us a production model at the end of August or beginning of September to review but it is now mid-September and I have had neither a model to review or even a reason why they were unable to supply an Amber. I can only suppose that Amber have had production problems.

Anyway, back to the review. I was in the unusual position of having the manual for the printer several days before I actually had a working printer. The manual can only be described as horrific! After spending a good few hours with it I thought I was going to have a pretty ornament but a useless printer. The beginner to computing has no chance to understand it.

Undaunted when I actually got the printer I connected up the cable, pressed CTRL-B to switch the printer on and hey presto it worked first time with no problems at all. There are no special \*FX calls needed — all you need to know is CTRL-B or VDU2 will turn the printer on and CTRL-C or VDU3 will turn it off again. When I say turn on and off I don't mean the power — this is done by a switch at the back. What you do is decide whether what is printed on the screen is or isn't printed onto the printer.

If you are just going to use the printer for normal printing this is all you actually need to know. The entire character set of the printer is listed below:

```

32 =      33 = !   34 = "   35 = #
36 = $   37 = %   38 = &   39 = '
40 = (   41 = )   42 = *   43 = +

```



44 = ,	45 = -	46 = .	47 = /
48 = 0	49 = 1	50 = 2	51 = 3
52 = 4	53 = 5	54 = 6	55 = 7
56 = 8	57 = 9	58 = :	59 = ;
60 = <	61 = =	62 = >	63 = ?
64 = @	65 = A	66 = B	67 = C
68 = D	69 = E	70 = F	71 = G
72 = H	73 = I	74 = J	75 = K
76 = L	77 = M	78 = N	79 = O
80 = P	81 = Q	82 = R	83 = S
84 = T	85 = U	86 = V	87 = W
88 = X	89 = Y	90 = Z	91 = [
92 = \	93 = ]	94 = ^	95 = _
96 = `	97 = a	98 = b	99 = c
100 = d	101 = e	102 = f	103 = g
104 = h	105 = i	106 = j	107 = k
108 = l	109 = m	110 = n	111 = o
112 = p	113 = q	114 = r	115 = s
116 = t	117 = u	118 = v	119 = w
120 = x	121 = y	122 = z	123 = {
124 =	125 = }	126 = ~	127 =
128 =	129 =	130 =	131 =
132 =	133 =	134 =	135 =
136 =	137 =	138 =	139 =
140 =	141 =	142 =	143 =
144 =	145 =	146 =	147 =
148 =	149 =	150 =	151 =
152 =	153 =	154 =	155 =
156 =	157 =	158 =	159 =
160 = á	161 = â	162 = ã	163 = ä
164 = å	165 = æ	166 = ç	167 = è
168 = é	169 = ê	170 = ë	171 = ì
172 = í	173 = ï	174 = ð	175 = ñ
176 = ò	177 = ó	178 = ô	179 = õ
180 = ö	181 = ù	182 = ú	183 = û
184 = ü	185 = £	186 = ¤	187 = ¥
188 = ↑	189 = ↓	190 = ←	191 = →
192 = P	193 = Q	194 = R	195 = S
196 = T	197 = U	198 = V	199 = W
200 = X	201 = Y	202 = Z	203 = [
204 = \	205 = ]	206 = ^	207 = _
208 = P	209 = q	210 = r	211 = s
212 = t	213 = u	214 = v	215 = w
216 = x	217 = y	218 = z	219 = {
220 =	221 = }	222 = ~	223 =
224 =	225 =	226 =	227 =
228 =	229 =	230 =	231 =
232 =	233 =	234 =	235 =
236 =	237 =	238 =	239 =
240 =	241 =	242 =	243 =
244 =	245 =	246 =	247 =
248 =	249 =	250 =	251 =
252 =	253 =	254 =	255 =

This is the standard character set and the one I would recommend you stick to for your BBC Micro. The set is in fact the American version. If you selected the British one the hash would come out as a pound sign. Also available is German and Swedish versions — which one you choose

is selectable by dip switches inside the printer. Using the default option the only problem is that if you wish a pound sign to be printed you must use the value of 185 (i.e. VDU185 or PRINTCHR\$(185)).

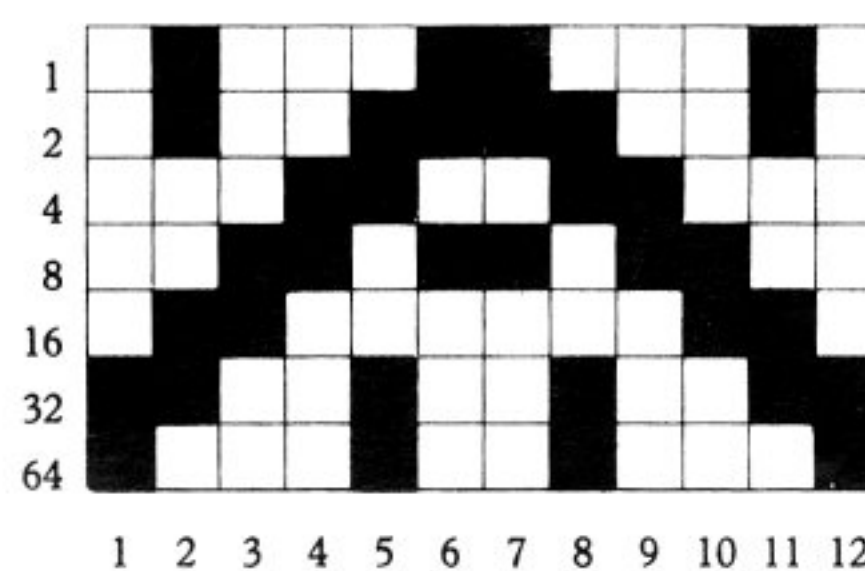
So what if you want to experiment with other types of printing i.e. more than just copying listings. You must remember that the printer is fairly cheap and as such it is not capable of too much. Even so there is still quite a lot that can be done.

Supposing you want to print double width characters. All you need do is enter VDU1,&0E and automatically this is done. VDU1,&0F will switch you back to normal. The other text facility you have is position control for the text. In other words with a bit of experimentation and a good program you can produce a very neat letter with the text being both left and right justified. You might after learning this piece of information start considering the GP as a cheap printer for your business — forget it! The GP is in no way suitable for business use for many reasons. Among those are (i) it has no true descenders (i.e. the tail of a letter like g does not go below the line), (ii) it only has an 80-column capability (i.e. no 96 or 132 chars/line) and (iii) it works extremely slow (30 chars/sec). It is fine for use by the hobbyist which means most of you but it cannot even be considered for serious applications. If you want a cheap business printer then I suggest you look towards the Star DP-8480. If you want a proper printer (dot-matrix, not daisy-wheel) then the Epsom range is where you should be looking.

I am not trying to put you all off the GP — it is a very good printer. I am just trying to draw the line between hobby printers and business printers.

Back to the review. The GP has, for the price, a very good graphic capability. It has a resolution of 480 pixels across which means you could copy any screen exactly except MODE0. Before I continue let me make one point about copying screens exactly. Below you will find a screen dump program. When I wrote this originally I copied the screen dot for dot. This may sound good but when you see the printout you find that the vertical part has been pulled out by about 3 times too much. That means when you try to copy a circle you end up with something that looks like an egg! Hence it is not always a good idea to copy the screen as accurately as it is.

To switch on the graphic mode you must enter VDU1,&08. Now to use this mode you must cast your mind back to when you first learnt to define characters because the principal is the same. The GP uses a 5 × 7 dot matrix. You needn't worry about the width but it is the height you have to enter. What you need to do is enter individual bars across the screen. Let us suppose that the pattern we wish to copy is:



After switching the graphic mode on, everything you enter must be in a proper 8-bit code. As you can see from the above the picture is only made up of seven bits and hence you must add 128 to the value you get. To enter the first line the value can easily be calculated as 32 + 64 + 128 = 224. The second line would be 1 + 2 + 16 + 32 + 128 = 179, etc. As you can see quite complicated graphics patterns can be built up. The program that produces the example above and a sample run is listed below.

#### LIST

```

10 VDU2
20 REPEAT
30   READPchar
40   VDU1,Pchar
50   UNTILPchar=&0F
    
```



```

60 PRINT
70 VDU3
80 END
90 DATA&08,224,179,152,140,230
139,139,230,140,152,179,224,&0F

```

```

>RUN

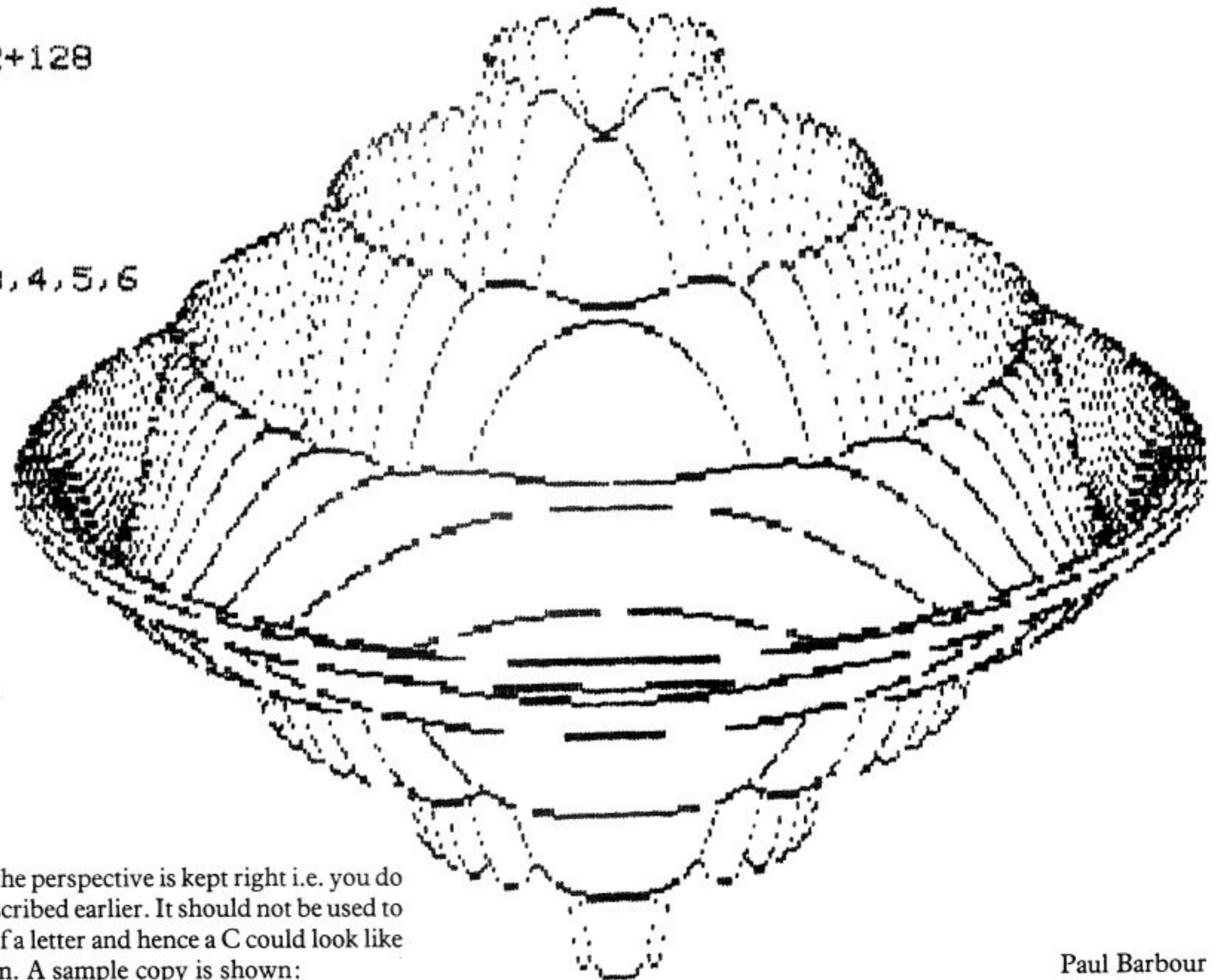
```

With this method you should be able to see that a screen dump program would be very easy to do. To save you the effort of working this out I list below PROCscreen\_dump. This should be put at the end of a program and called whenever necessary. Remember not to use it in MODE's 3, 6 or 7.

```

>L.
10000 DEFPROCscreen_dump
10010 DIMCHAR%(7)
10020 VDU2,1,&08
10030 FORY=1023TO0STEP-24
10040 FORX=0TO128STEP4
10050 RESTORE
10060 FORY1=Y TOY-18STEP-3
10070 READV
10080 IFPOINT(X,Y1)>0THENCHAR%(V)=
1ELSECHAR%(V)=0
10090 NEXT
10100 PCHAR=0
10110 FORC=0TO6
10120 IFCHAR%(C)=1THENPCHAR=PCHAR+
2^C
10130 NEXT
10140 PCHAR=PCHAR+128
10150 VDU1,PCHAR
10160 NEXT
10170 VDU1,&0D
10180 NEXT
10190 VDU3
10200 DATA0,1,2,3,4,5,6

```



It has been altered suitably so that the perspective is kept right i.e. you do not have the circle/egg problem described earlier. It should not be used to copy text as it may miss a line out of a letter and hence a C could look like an L. It will work at any resolution. A sample copy is shown:

This article started out as a review however looking back over it the whole thing looks more like a beginners guide to the Seikosha. However, in proper review form I will draw a conclusion and list some of its specifications.

The GP/AP is a very reliable printer. I have had no problems with it and found its performance very satisfactory. It is a cheap printer and hence does not have a long list of features. It should however be more than suitable for the normal hobbyist. The print quality is good and the price of both the printer and consumables needed (i.e. paper, ribbon) are reasonable. After buying the computer and a monitor I would recommend a printer to be the next peripheral you buy and this one fits the role well.

MANUFACTURER: Seikosha (although it can be bought with the Acorn logo on it).

PRICE: £200-£250. £225 is a normal price

CHARS/LINE: 80 (40 in double width mode)

CHARS/SEC: 30 (uni-directional)

CHAR. MATRIX: 5 x 7

INTERFACE: Parallel

CHARACTER SET: 116

TRUE DESCENDERS: No

GRAPHICS RESOLUTION: 480 pixels X n lines

PAPER FEED: Traction

COPIES: Original + 2 copies

PAPER WIDTH: 4½ - 10"

SIZE: 234.5 x 420 x 136mm

WEIGHT: 4.5kg (Approx)



If you would like to get in touch with other local users but do not want to get involved in the organisation 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.

- Dr D E Susans  
19 Rushout Avenue,  
Harrow,  
Middx. HA3 OAS  
01-907 1964
- Wayne Wealleans  
7 Hillman's Cottages,  
Ongar Road,  
Abridge,  
Essex RM4 1UL  
Theydon Bois 4154
- Dr John Willis  
27 Park Road,  
Hampton Hill,  
Midx. TW12 1HG  
01-979 6655
- John Matchett  
01-940 9361
- W G Morley  
107 Sandfield Road,  
Arnold,  
Nottingham NG5 6QF  
0602-267635
- Mr John F Murphy  
10 Birchmore,  
Brookside,  
Telford,  
Shropshire  
0952-595959
- Mr P S Murphy  
01-740 8082
- G Musgrove  
16 Orchard Road, South Croydon  
Surrey CR2 9LU  
01-651 0011
- Nicholas D Lamb  
23 Gaywood Close,  
Caister-on-Sea,  
Gt. Yarmouth,  
Norfolk NR30 5RD  
0493-728442
- N Lambert  
11 Vinson Close,  
Orpington,  
Kent BR6 OEQ
- R W Macmillan  
38 Box Ridge Ave.,  
Purley,  
Surrey CR2 3AQ  
01-660 5615
- Mr Mark Cook  
165 Witham Road,  
Black Notley,  
Braintree,  
Essex CM7 8NB  
0376-23084
- R Hall  
89 Hicks Ave.,  
Greenford,  
Middx UB6 8EZ  
01-578 9136
- David N Hardwick  
Hagley 885183
- Laurie Hartman  
178 East Barnet Road,  
Barnet,  
Herts EN4 8RD
- John Harvey  
93 Southfield,  
Hessle,  
N. Humberside HU13 OET  
0482 645905
- A R J Hunt  
22 Meyer Road,  
Erith  
Kent  
Erith 38620
- David H M Glew  
20 Barnfield Wood Road,  
Beckenham,  
Kent  
01-650 1365
- E E Godfrey  
6 Wharf Road,  
Wraysbury,  
Nr. Staines,  
Middx. TW19 5JQ  
Wraysbury 2624
- D T Green  
Bay House, Painter's Forstal,  
Faversham,  
Kent ME13 OD  
Faversham 6483
- Peter Greenall  
77 Memorial Ave.,  
Stratford,  
London E15
- Paul E Firman  
63 Lady Lane,  
Chelmsford,  
Essex CM2 OTQ  
0245 50432
- P Y Norman  
Flat 2,  
3 Cedar Gardens,  
Sutton,  
Surrey SM2 5EQ  
01-643 1944
- Mr J D Osborn  
8 Chytroose Close,  
Helston,  
Cornwall TR13 8UY  
Helston 4121 Ext. 7378
- James Stewart  
Lammas Field,  
Baring Road,  
Cowes,  
Isle of Wight.  
Cowes 292107
- Mr Dilbagh Singh  
29 Wingfield Mount,  
Bradford  
West Yorkshire BD3 OAG
- Mr M F Shirt  
39 Orchard Road,  
West Northenden,  
Manchester M22 4FD
- E A Watson  
19 Darrell Close,  
Chelmsford,  
Essex CM1 4EL  
Chelmsford 83790
- Ian Dennison  
38 Tankerville Road,  
Londn SW16 5LP  
01-764 4958
- Mr R W Thompson  
Redhill 63232
- Stephen E Parsons  
16 Primrose Hill,  
Haverhill,  
Suffolk CB9 9LS  
0440-704422 Ext. 52
- D I Pearce  
Little Orchard,  
Brentmoor Road,  
West End,  
Working,  
Surrey
- Brian D Piper  
73 Fairlawn Drive,  
East Grinstead,  
West Sussex RH19 1NS  
0273-23373
- P W Rautenbach  
25 Bishopsfield,  
Harlow,  
Essex CM18 6UJ
- Mr H E Robson  
Church Farm,  
Stewkley,  
Nr. Leighton Buzzard  
0525-24244
- Paul Shaddick  
325 Wickham Lane,  
Abbey Wood,  
London SE2 ONT  
01-854 7766
- J M Stone  
8 Sandra Court,  
Spencer Road,  
Chiswick,  
London W4  
01-995 6144



- V A Amesbury  
33 King Edgar Close,  
Ely,  
Cambs. CB6 1DP  
Ely 3274
- C G Bartholomew  
102 Cranley Gardens,  
Muswell Hill,  
London N10 3AH  
01-883 2624
- Mr A J Beer  
2 Waterworks Cottages,  
Dotton,  
Sidmouth,  
Devon EX10 OJY
- Rick Branston  
37 Princes Road,  
Romford,  
Essex  
Romford 61336
- Daniel O'Brien  
5 Highfields Mead,  
East Hanningfield,  
Chelmsford,  
Essex CM3 5XA
- B Buckland  
Purton 771669
- Simon Cheshire  
1 Knowsley Way,  
Hildenborough,  
Kent TN11 9LG  
Hildenborough 833108
- Dave Clare  
"Providence House",  
222 Townfields Road,  
Winsford,  
Ches. CW7 4AX  
Winsford 51374
- Dr P G Clayton  
Chigwell School,  
High Road,  
Chigwell,  
Essex
- Nicholas Clifton  
4 Bonchester Close,  
Chislehurst,  
Kent BR7 5FS  
01-467 5396
- R F Colin  
13 Pembroke Road,  
Moor Park,  
North Wood,  
Middx. HA6 2HP
- Peter M Corrie  
58 High Street,  
Haslemere,  
Surrey GU27 2LA  
0428 3838
- G Cox  
78 Napier Road,  
Gillingham,  
Kent  
0634 55475
- David Dade  
30 Hilden Park Road,  
Hildenborough,  
Tonbridge,  
Kent TN11 9BL  
0732 838603
- P J Davies  
'Treetops',  
Burnham Road,  
Althorne,  
Chelmsford,  
Essex CM3 6DP  
Maldon 740084
- Mr Chris Drage  
28 Ingersoll Road  
Shepherds Bush,  
London W12.
- R.M. Timothy  
35 Potash Road,  
Billericay,  
Essex CM11 1DL.
- Catherine Brown  
2 Plas Newydd,  
Southend-on-Sea,  
Essex, SS1 3AG.  
0702-587066.
- JR Dyer 0954-81074.
- Roger Gibbons,  
Lynford Recreation Road,  
Stalham,  
Norfolk.  
0692-80410.
- Stephen Hart,  
42 Midship Point,  
Malabar Street,  
London E14.
- David Phillips,  
49 Hartfield Avenue,  
Elstree,  
Herts.
- David Simpson,  
435 Fulham Palace Road,  
London SW6.  
01-731 5281.
- AF Bell,  
Yarawina,  
Woodhurst Park,  
Oxted,  
Surrey.  
08833-2491.
- Paul Barbour,  
10 Dawley Ride,  
Colnbrook,  
Slough,  
Berks. SL3 0QH.  
Colnbrook (02812) 3064.

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Instead of reviewing one particular companies software as in the previous two reviews this month we are going to look at a wide range of programs.

I would like to thank Micro-Aid, IJK (Sinclair) Software, CJE Microcomputers and Software for All for supplying us copies of their programs to review. The software from Bug-Byte and Acornsoft was bought by either myself or other members of LASERBUG due to lack of co-operation.

**PROGRAM:** Battle

**SUPPLIER:** Micro-Aid, 25 Fore Street, Praze-an-Beeble, Cambourne, Cornwall, TR14 OJX. 0209-831274

**PRICE:** £2.50

**DESCRIPTION OF PROGRAM:** This game starts with the Union Jack being displayed on the screen and the noises of gunfire in the background. Anyone who respects the Union Jack would be ashamed to see it on a game such as this one. The theme is the Falklands. "... the aim is to reach Home Base without being blown up. The style is very similar to that encountered by the engineers trying to clear the minefields in the Falklands... Take care—remember that you can play again but the soldiers in the Falklands couldn't!!" That was a quote from the instructions to the program—need I say more. The theme of the program is in extremely bad taste as is the game itself. If you should happen to tread on a mine "Boom!!... You're dead. Tough luck." is the comment you get. That is a remark on the morals of the game. If you ignore the theme and try playing the game itself this is extremely boring—it doesn't even work properly! For instance at one point in the game it asks you a question to which a yes or no answer is required. No matter what you answer it does what it likes anyway. The game itself is very poor and would not warrant you even looking at it. However, considering its theme I would recommend to Micro-Aid very strongly to withdraw it from sale.

**VALUE FOR MONEY:**\*

---oOo---

**PROGRAM:** Monsters

**SUPPLIER:** Acornsoft, 4a Market Hill, Cambridge, CB2 3NJ. 0223-316039

**PRICE:** £9.95

**DESCRIPTION OF PROGRAM:** Monsters is a splendid version of this highly-addictive arcade game. You are being chased by monsters along a series of walls and up and down ladders. The only way to get rid of the monsters is to dig a hole, wait for a monster to fall in it and then fill the hole up quick. You only have a limited oxygen supply and all the running around you have to do depletes this very quickly. The game has excellent graphics and sound and is very well written. There are three types of program you can buy—yuk!!!, amateur and professional. Most of the software around is amateur but Monsters fits most definitely into the professional category.

**PRESENTATION:**\*\*\*\*

**USE OF GRAPHICS:**\*\*\*\*\*

**ADDICTIVE QUALITY:**\*\*\*\*\*

**VALUE FOR MONEY:**\*\*\*

---oOo---

**PROGRAM:** Chess

**SUPPLIER:** Bug-Byte, 98-100 The Albany, Old Hall Street, Liverpool, L3 9EP. 051-227 2642.

**PRICE:** £11.50.

**DESCRIPTION OF PROGRAM:** On the instructions you get with this game you are told to enter \*RUN"CHESS" to load in the program. This is all very good but the title of the program is BEEBCHESS and hence if

the novice does as he is told he will never load the program. Despite this, once the program is actually loaded it plays a very good game. There are 1000 levels of play which allows it to be played by most people. As well as playing the game normally you can change the board set-up completely, list all the moves made so far either to the screen or printer and save the game on tape to catch up with it later. The screen representation of the board is satisfactory and in my opinion you do not need to play it with a proper chess board by the side of you once you are used to the game. This program gave me a good run for my money although if you aren't careful you can get into the habit of re-arranging the board when you are losing to your advantage.

**PRESENTATION:**\*\*\*

**USE OF GRAPHICS:**\*\*\*

**COMPLEXITY:**\*\*\*\*

**RESPONSE SPEED:**\*\*\*

**VALUE FOR MONEY:**\*\*\*

---oOo---

**PROGRAM:** Super Hangman

**SUPPLIER:** Sinclair (IJK Software), 55 Fitzroy Road, Bispham, Blackpool, Lancs. 0253-591805

**PRICE:** £3.95

**DESCRIPTION OF PROGRAM:** This "Super Hangman" can be described as super for two reasons. The first is because the words are quite hard. The second is because the hanging man is drawn in hi-res graphics. The detail is very good and livens up the game no end. The person wears a bowler hat (a green one!) and a tee-shirt with the word YOU on it. If you take too long to give an answer the person comes out with why are we waiting. Not only is the tune played but he clicks his fingers and taps his feet as well. If I went into any more detail I would spoil the actual game if/when you buy this cassette. This game is very good and at only £4 is very good value for money.

**PRESENTATION:**\*\*\*

**USE OF GRAPHICS:**\*\*\*\*\*

**VALUE FOR MONEY:**\*\*\*\*\*

---oOo---

**PROGRAM:** Polaris

**SUPPLIER:** Bug-Byte (address and phone number above)

**PRICE:** £8.00

**DESCRIPTION OF PROGRAM:** Polaris is a game of submarine warfare. It is poorly written in BASIC i.e. the game freezes when you or the enemy shoot. It is extremely hard to win at and the problems you incur seem to be totally random and bear no resemblance to what is actually happening. You are controlling a submarine and must try to destroy so many millions of tons of shipping before either you run out of air or 6 holds are flooded. As well as trying to avoid the shoreline you must try to avoid the depth charges, aircraft carriers and bombs dropped from air attacks. This game could have been written much better and after a while soon gets boring.

**PRESENTATION:**\*\*\*

**USE OF GRAPHICS:**\*\*\*

**RESPONSE SPEED:**\*

**VALUE FOR MONEY:**\*\*

---oOo---



PROGRAM: Balloons

SUPPLIER: CJE Microcomputers, 25 Henry Avenue, Rustington, W.Sussex, BN16 2PA. 09062-74998

PRICE: £6.00

DESCRIPTION OF PROGRAM: Balloons is the kind of game you would expect to see in a heat of It's a Knockout. You must climb to the top of a castle to get a number of balloons while faced with a number of obstacles i.e. beach balls, falling weights and water cannons. For the adult the novelty soon wears off but I think it is a game that children will enjoy. The formatting in a few places could have been better but as I said it is mainly small children who will find it very good.

PRESENTATION:\*\*\*

USE OF GRAPHICS:\*\*\*

VALUE FOR MONEY:\*\*\*

--oOo--

For the final part of this review I am going to compare two similar games. Both are teletext versions of Space Invaders. One is produced by Sinclair (IJK Software) whose address is above and the other by Software for All who reside at 72 North Street, Romford, Essex. 07089-60725.

Both programs are roughly the same size although the SFA run must be \*RUNed instead of CHAINED. The presentation of the program is slightly better on the SFA One. The Sinclair version offers 4 different options which differ in missile and invader speed. With this one you use the Z/X/space for controls although the SFA program gives you a choice of whatever keys you like. Both invaders have high-score features although Sinclair's scores seemed to be wiped off if you changed the level of play.

The game played by both of these versions are very similar to the original. With the Sinclair one you can shoot through the shields but cannot destroy the falling bombs. The graphics are fairly simple but a fast game is played from the very start. The invaders speed up as more and more are destroyed as you would expect. With the SFA program you cannot shoot through bases but can hit bombs. The graphics are much better but the cost you pay is speed although the game does speed up as you get into it more.

The scoring varies between the games. With the SFA version you get a higher score the more waves of invaders you kill. With Sinclair's program you get the same score throughout.

There is not too much to choose between the two programs—both had their good and bad points. The Sinclair one plays a faster game from the beginning but the SFA version has better graphics and hence makes the game more interesting. The difference mainly is the price—the Sinclair one is £2 cheaper.

Both games are very good and use teletext graphics to good effect.

#### SINCLAIR SOFTWARE FOR ALL

PRESENTATION:	***	****
ADDICTIVE QUALITY:	***	***
USE OF GRAPHICS:	***	****
RESPONSE SPEED:	****	***
VALUE FOR MONEY:	****	***

Paul Barbour

## mortgages

As most people will have received or will be about to receive a statement of their mortgage account I enclose the following programme which will reveal details of amounts owing in the years ahead and can provide a pointer to the optimum point for mortgage redemption. It can also be used for working out repayment amounts/times when one is thinking about new mortgages. Perhaps more relevant, one can also work

out the effects of mortgage interest rate changes, assuming one keeps either the amount paid or the years left unchanged.

In line 40 the years to pay need not be the exact time left on a mortgage; 25 could always be inserted. All that happens is that some of the later years are negative i.e. mortgage has been paid off. In line 60 insurance per month is included because many building societies insist that adequate insurance be taken out and include it on the monthly repayments. If yours does not then simply enter 0.

Tony Atfeinson

>LIST

10REM " MORTGAGE "

20INPUT"% INTREST ",I

30INPUT"MONTHLY REPAYMENT ",M

40INPUT"YEARS TO PAY ",Y

50INPUT"DEBT AT SEPT 30TH ",D

60INPUT"INSURANCE PER MONTH ",C

70Z=1

80FORA=1TOY

90T=(D\*(I/100))/12

100E=(M-T-C)\*12

110D=D-E

120B=INT(D)

130PRINTTAB(10),"YEAR ";Z;" - ";

B

140Z=Z+1

150NEXTA

>RUN

% INTREST ?11

MONTHLY REPAYMENT ?140

YEARS TO PAY ?25

DEBT AT SEPT 30TH ?11500

INSURANCE PER MONTH ?0

YEAR 1 - 11085

YEAR 2 - 10624

YEAR 3 - 10113

YEAR 4 - 9545

YEAR 5 - 8915

YEAR 6 - 8216

YEAR 7 - 7439

YEAR 8 - 6578

YEAR 9 - 5621

YEAR 10 - 4560

YEAR 11 - 3382

YEAR 12 - 2074

YEAR 13 - 622

YEAR 14 - -990

YEAR 15 - -2779

YEAR 16 - -4764

YEAR 17 - -6968

YEAR 18 - -9415

YEAR 19 - -12130

YEAR 20 - -15145

YEAR 21 - -18491

YEAR 22 - -22204

YEAR 23 - -26327

YEAR 24 - -30903

YEAR 25 - -35982



Many of you may have been unaware of the problems we have been having with BEEBUG until very recently. The problem started in August when a letter appeared in the September edition of *MicroComputer Printout* from Mr. Williams:

## Bugs squashed

I have just read the letter from G. Mayer in the July issue of *MicroComputer Printout*. BEEBUG is currently investigating his claims about appointed dealers, but I can confirm that some are indeed taking such an attitude. We will report in future issues of our newsletter.

Secondly, in your reply at the end of the letter you state that owners of BBC Micros should join one of the 'Independent' user groups such as BEEBUG or Laserbug. May I state categorically that as far as I know the only *truly independent* user group is BEEBUG. Laserbug are run by a shop called 'Computers for All', and cannot represent their members in a truly independent way. For example they recommend to their members that to convert BBC machines from 16K to 32K that they buy the chips from them at over *twice* the price that BEEBUG has negotiated, thus costing their trusting members an extra £20 or so!

Sheridan Williams,  
St. Albans, Herts

*We invite Laserbug to reply, defending their case.*

---

(Reproduced with permission)

No warning was given about this letter—Sheridan Williams didn't even contact me about the allegation! Hence a formal reply was sent from me the very next day. So you know exactly what was said I will re-write the letter below:

Although I accepted it as a known fact when I first read through the letter in question, I later realised that no-where does Mr. Williams state that the group he is promoting (which I feel is the main purpose of the letter) is the one he is co-Editor of. I realise now that not all readers might be aware of this (\*\* Remember this was printed in a magazine that caters for many computers and so the readers will not all be up to date with the BBC Micro situation\*\*).

Mr. Williams stated that "LASERBUG are run by a shop called 'Computers for All', and cannot represent their members in a truly independent way." LASERBUG is independent of all outside bodies, always was independent of all outside bodies and always will be independent of all outside bodies. The first Editor of the LASERBUG newsletter, Trevor Sharples, has a friend who works for Computers for All and as such Trevor's friend helped him to buy his computer and of course offered him advice here and there. This in no way means that LASERBUG is run by this company—as I have a friend in the BBC will Mr. Williams be writing next month to say that the BBC is being secretly run by LASERBUG? Trevor Sharples handed the responsibility of editing and organising LASERBUG over to me several months ago and although indirectly this myth of Computers for All running LASERBUG seems to have carried on to me, I can wholeheartedly assure you that this is not true.

One thought that did come to mind is how did Mr. Williams find out that Trevor was friendly with someone from Computers for All. The fact was never hidden but on the other hand he didn't go around putting 'oh and by the way I just happen to have a friend in Computers for All who really runs LASERBUG' in our newsletter. To the best of my knowledge

no-one who helps me run LASERBUG even knows Mr. Williams and so short of hiring a private detective to follow Trevor around, how did Mr. Williams even know of Trevor's friend?

Mr. Williams also states that "...they recommend to their members that to convert BBC Machines from 16K to 32K that they buy the chips from them..." (Computers for All) "...at over twice the price that BEEBUG has negotiated, thus costing their trusting members an extra £20 or so!" On looking through the back issues of LASERBUG I cannot see anywhere us recommending the Computers for All memory upgrade. The only thing I have seen is an advert for Computers for All quoting their price for their upgrade. It is clear that this is only an advert and not a recommendation.

If I may take a moment to digress and defend Computers for All, their memory upgrade is the official Acorn upgrade (hence it includes both the chips and fitting them) and is charged at official prices. If members of BEEBUG purchase the upgrade recommended by Mr. Williams (and he does actually recommend it) and fit it, they automatically invalidate their computer's guarantee. Hence if anything should go wrong with their BBC Micro while it is still under the warranty period then the person concerned will be required to pay for the repairs, whether or not the fault had anything to do with their DIY upgrades.

Perhaps the fact that Computers for All actually advertise in LASERBUG has also made Mr. Williams think that they run my group. If this is the case then Bug-Byte (who also run their own magazine—note I said magazine and not user group—for the BBC Micro), Epsilon Software and Futura Software must also run LASERBUG. To take this even further, perhaps the actual fact that a company is mentioned in LASERBUG means to Mr. Williams mind that they must also run it. As so far in our magazine we have mentioned about 20 different firms who include such diversities as WH Smiths of RCS Ltd., so now LASERBUG is run by a joint partnership of 23 companies—as you can see the whole thing is ridiculous.

Although our mailing address is in Forest Gate, most of LASERBUG is co-ordinated from my home address in Colnbrook, Berks. It is not too hard to forward mail from our mailing service to Colnbrook via the post office but if you find a map and draw a line from Staines to Romford (where Computers for All are based) can you honestly see somebody commute this distance just to run a user group?

What this will now boil down to is who is telling the truth—Sheridan Williams who writes in such places as *Personal Computer World* or *Paul Barbour* who until recently was a complete unknown. I cannot influence your opinion in a spot such as this but I will now offer that if any member of LASERBUG still thinks that we are run by Computers for All or any other outside organisation they are welcome to write to use and I will personally see that their subscription is refunded. While Mr. Williams claims he is completely independent I would like to know how in the mail-out by Acorn (which supplied the guarantee card to every owner of the BBC Micro) he managed to get a sheet in publicising his own group and in his magazine he openly admits to being invited down to Acorn for a meeting by the managing director of the company. Is this what he calls independence? If it is then Mr. Williams' definition of the word independence is that you can be independent of someone until you actually want something from them.

Mr. Williams in his letter is discussing ethics. Both the names LASERBUG and BEEBUG are neologisms and as such both should be in capitals. If you look at his letter, everywhere Mr. Williams mentions BEEBUG this is in capitals but when he mentions LASERBUG this is in small letters. You may think this is a small complaint but this has a strong psychological effect on the reader. As I mentioned above, Mr. Williams writes for PCW. At every chance he gets on his pages, when a letter is published about the BBC Micro, no matter what the letter is about he always just happens to find a way of bringing BEEBUG into the conversation. Even if he doesn't bring his name into it instead he puts the reply in the name of Dr. David Graham, the co-Editor of BEEBUG.

Mr. Williams likes playing the numbers game and so every time he gets a new member he feels he must publicise this fact. If the only way Mr. Williams feels he can get members for his user group is to write untrue letters about his 'rivals' then I feel extremely sorry for him. Maybe he expects every owner of a BBC Micro to join his group. The fact that he is



now trying to take members away from another group must infer that he thinks we are superior to his organisation and hence is getting jealous?

Assuming you believe what I have said, there are two independent user groups for the BBC Micro. One (us) produces a monthly magazine, arranges and encourages meetings, is totally non-profit making and re-invests its money back into the group. The other (Mr. Williams' group) also produces a magazine (10/year) and after only 3 issues has started becoming commercialised. He and his organisation now sells software through the magazine and although I have not yet seen any of his wares I have been informed that the low prices correspond to the low quality in most cases. If Mr. Williams and BEEBUG wish to sell software, be it low priced or not, this should be done by setting up a completely separate company and taking risks like every other software manufacturer has to. Selling programs under the cover of a user group is not a practice I approve of. Commercialisation of a user group does not help its users.

A user group's first interest should be towards providing their members with information and protecting their interests, not indulging in petty rivalry. Mr. Williams should spend this time constructively to the benefit of his members and not wasting his time trying to start a 'slanging match' which I have no desire to be party to. When two organisations are striving for the same goal it is totally ridiculous when one starts to turn on the other.

I list below details of BOTH my user group (LASERBUG) and Mr. Williams' group (BEEBUG):

LASERBUG, 4 Station Bridge, Woodgrange Road, Forest Gate, London E7 ONF. Membership: £12 for 1 year including 12 issues of the newsletter.

BEEBUG, Dept. 1, 374 Wandsworth Road, London SW8 4TE (For subscriptions only). Membership: £8.90 for 1 year including 10 issues of the newsletter.

As a final plea I say to Sheridan stop trying to stir up bad feeling among our two groups and let us work together, concentrating on working to the mutual benefit of all BBC Micro owners.

And what was Sheridan William's reply to that you might ask? You would expect the reply to be either "I apologise, I realise I was wrong..." or "I still stand up to what I said...". The reply I got was a short note which (i) corrected me on a small error I made (the above letter has been altered), (ii) quoted BEEBUG's membership figure (see what I mean), and (iii) said "We are taking legal advice over aspects of your claims". That was it! Not what I would call a reply.

Anyway, the story does eventually end on a happy note. Fifteen minutes before the PCW Show ended on the Sunday Sheridan invited me for a cup of coffee. He said at this brief meeting that he now realised that he was wrong in what he had said and apologised completely. Thankfully therefore, friendly relations (well, at least semi-friendly relations) have been restored between LASERBUG and BEEBUG. Hopefully sometime in the future you will see greater co-operation between the two groups.

Before I close one or two of the computer magazines who will print anything as long as they think it will sell copies (notably Popular Computing Weekly) have latched onto this story and are making a big thing of it. Popular Computing didn't even have the sense to contact myself or Sheridan Williams to see what had actually happened or if the situation had been resolved. I would like to assure both them and you that this particular problem has been amicably resolved to both groups satisfaction.

Paul Barbour

## oxygen

Your spaceship has just had an extremely serious accident and your oxygen supply has been damaged. You must move to and from the oxygen re-cycling units and re-fill your backpack to survive. Sound simple? It would be but your ship has been overrun by aliens—touch one and you lose a life.

Use cursor keys to move between top and bottom oxygen unit. Each go you have less and less time to re-fill before you suffocate. If you press say cursor up/cursor right keys at once you get diagonal movement.

Have fun...

```
>LIST
10 REM          OXYGEN
20
30 REM Written by Paul Barbour
40
50 REM          (c) LASERBUG
60
70 REM          Version 1.1
80
90 REM          AUGUST 1982
100
110 MODE5:ONERRORGOTO420
120 VDU23;8202;0;0;0;:VDU19,0,3,
0,0,0,19,1,0,0,0,0,19,2,9,0,0,0,19
,3,2,0,0,0
130 DIMX%(10),Y%(10):PROCINIT:TI
ME=0
140 FORZ%=1TO10:IFAIR<8THENAIR=8
150 PROCMOVE:PROCPLAYER:IFINT(AI
R-(TIME/100))<=0THENAIR=TRUE:PROCE
ND
160 *FX15,1
170 NEXT:AIR=AIR-.5:GOTO140
180 DEFPROCINIT FORZ%=1TO10:X%(Z
%)=RND(19):Y%(Z%)=RND(20):NEXT:X%=
0:Y%=28:FLAG=2:SCORE=0:LIVES=3:AI
R=90:C=0:VDU23,224,56,56,16,56,84,1
6,40,68:VDU23,225,0,24,36,90,90,36
,24,0:VDU23,226,195,36,24,24,60,90
,90,255
190 VDU23,227,0,36,90,153,60,90,
90,255:ENDPROC
200 DEFPROCMOVE PRINTTAB(X%(Z%),
Y%(Z%));" ":X%(Z%)=X%(Z%)+(RND(7)-
4):Y%(Z%)=Y%(Z%)+(RND(7)-4):IFX%(Z
%)<0THENX%(Z%)=0
210 IFX%(Z%)>19THENX%(Z%)=19
220 IFY%(Z%)<0THENY%(Z%)=0
230 IFY%(Z%)>26THENY%(Z%)=26
240 C=C+RND(2):COLOUR3:IFC MOD2=
0THENPRINTTAB(X%(Z%),Y%(Z%));CHR#2
26ELSEPRINTTAB(X%(Z%),Y%(Z%));CHR#
227
250 IFX%(Z%)=X%ANDY%(Z%)=Y%THENP
ROCEND
260 ENDPROC
270 DEFPROCPLAYER PRINTTAB(X%,Y%
);" ":IFINKEY(-26)THENX%=X%-1
280 IFINKEY(-122)THENX%=X%+1
290 IFINKEY(-58)THENY%=Y%-1
300 IFINKEY(-42)THENY%=Y%+1
310 IFX%<0THENX%=0
320 IFX%>19THENX%=19
```



```

330 IFY%<0 THENY%=0
340 IFY%>26 THENY%=26
350 PRINTTAB(X%,Y%);:A%=135:IF((
USR(&FFF4)AND&FF00)/&100)>225 THENP
ROCEAD
360 COLOUR1:PRINTTAB(X%,Y%);CHR#
224:IFX%=19ANDY%=0ANDFLAG=2THENSOU
ND0,-15,200,1:FLAG=1:SCORE=SCORE+1
:TIME=0
370 IFX%=0ANDY%=26ANDFLAG=1THENS
OUND0,-15,200,1:FLAG=2:SCORE=SCORE
+1:TIME=0
380 COLOUR1:PRINTTAB(7,28);"SCOR
E ";4*SCORE^2;"CHANCES LEFT";TAB(1
3);LIVES'TAB(4)"AIR LEFT";TAB(13);
INT(AIR-(TIME/100));" ":COLOUR2:PR
INTTAB(19,0);CHR#225:TAB(0,26);CHR
#225:SOUND3,-10,165-INT(AIR-(TIME/
100)),1:ENDPROC
390 DEFPROCEND SOUND1,-15,1,25:S
OUND2,-15,5,25:IFAIR=TRUE THEN420
400 LIVES=LIVES-1:IFLIVES<1THEN4
10ELSEENDPROC
410 COLOUR1:PRINTTAB(13,29);"0"
420 COLOUR2:PRINTTAB(5,8);"GAME
OVER":PROCPAUSE(2):IF(4*SCORE^2)>
H% THENH%=4*SCORE^2
430 H#="HIGH SCORE "+STR$(H%):T=
INT((20-LEN(H#))/2):PRINTTAB(T,11)
;H#:PROCPAUSE(4):PRINTTAB(3,16)"AN
OTHER GAME?";TAB(3,19)"(PRESS Y O
R N)":*FX15,1
440 A#=GET$:IFA#="Y"THENCLEAR:RU
N
450 IFA#="N"THEN470
460 GOTO440
470 VDU22,7
480 END
490 DEFPROCPAUSE(D):TIME=0:REPEA
TUNTILTIME>(D*100):ENDPROC

```

## teletext terminal

After Dave Leedham's program in issue 2, I was prompted to alter his program so that not only can you create teletext pages but can also save/load them from tape. For creating pages see LASERBUG issue 2 for reference. Make sure you have the tape set when recording.

If you run your BBC Micro as a disk computer try altering this program even more and you could have your very own Ceefax or Oracle!

LIST

```

10 REM *****
***
20 REM * Written by PAUL BARBOU
R *
30 REM *

```

```

*
40 REM * Version 1.1
*
50 REM *
*
60 REM * Screen editor based o
n *
70 REM *
*
80 REM * a Program by
*
90 REM *
*
100 REM * Dave Leedham
*
110 REM *
*
120 REM * (C) LASERBUG JULY 198
2 *
130 REM *****
***
140 ONERRORRUN
150 *KEY10OLDIMRUNIM
160 *FX4,1
170 MODE7
180 PRINTTAB(10);CHR#141;"TELETE
XT TERMINAL"TAB(10);CHR#141;"TELE
TEXT TERMINAL"STRING$(40,"-")
190 PRINT"SELECT FUNCTION:"'"1.
CREATE PAGE"'2. LOAD PAGE"'3. L
OAD AND EDIT PAGE"
200 VDU23;8202;0;0;0;:A=GET:IFA<
490RA>51THEN200
210 MODE7:IFA=49THEN240
220 IFA=50THENPROCSCREEN_LOAD:A=
GET:RUN
230 IFA=51THENPROCSCREEN_LOAD:GO
TO300
240 PRINT"MAKE SURE RECORD/PLAY
ARE PUSHED DOWN."'"TO SAVE A SCRE
EN ON TAPE, PRESS 'COPY'""TWICE."
250 TIME=0:REPEATUNTILTIME>1200
260 CLS:*FX4,1
270 INPUT"ENTER TELETEXT PAGE NU
MBER ",N%:IFN%<1ORN%>9999THEN270
280 CLS:H#="TELETEXT PAGE "+STR$
(N%)
290 T=INT(40-LEN(H#))/2:PRINTTAB
(T);H#
300 G=0
310 C=INKEY(0):IFC=-1THEN310
320 IFVPOS>23THENPRINTTAB(POS,VP
OS-1);
330 IFVPOS=0THENPRINTTAB(POS,1);
340 IFC=135THENPROCmistake
350 IFC>135ANDC<140THENC=C-128:"
DUC:GOTO310

```



```

360 IFC=9THENG=64:C=GET
370 IFC=127THENP=255ELSEP=C+G
380 VDU19,0,3,0,0,0,19,1,0,0,0,0
390 *FX4,0
400 *FX139,0,0
410 PRINT:END
420 DEFPROC MISTAKE C=GET:IFC=135
THEN PROC SCREEN_DUMP:RUN:ELSE ENDPROC
C
430 DEFPROC SCREEN_DUMP
440 *FX139,1,0
450 T$="SCREEN"+STR$(N%):SCREEN=
OPENOUT("T$")
460 FOR P=HIMEM TO(HIMEM+999):D=?
P
470 BPUT#SCREEN,D
480 ?P=255:NEXT
490 CLOSE#SCREEN
500 ENDPROC
510 DEFPROC SCREEN_LOAD
520 *FX139,1,0
530 SCREEN=OPENIN(" ")
540 FOR P=HIMEM TO(HIMEM+999):?P=
BGET#SCREEN:NEXT:CLOSE#SCREEN:ENDPROC
ROC

```

## business special

After looking through the questionnaires one type of article many of you requested was something on business. Although this series will be irregular (at least for the moment) hopefully all of it would be useful.

The title of this article is wordprocessor. Although the program below might not be worthy of that name to the sense that most businessmen apply to it, it is certainly a helpful aid. The listing performs more of a computerised typewriter with a few special features than a wordprocessor.

The features of this wordprocessor are:

- Cursor keys—move text cursor (as per usual screen editing)
- Delete key—delete text (as per usual screen editing)
- Tab key—moves 10 (or other amount) of spaces (as per PRINTTAB)
- f0— clear screen (as per CLS)
- f1— clear line (the one the cursor is currently on)
- f2— alter the amount the TAB key moves. After pressing f2 enter a 2-digit number as the new amount. A question mark will appear to which you should press 'Y' if correct and continue as usual. If you entered the wrong amount press 'N' and enter the new value.
- f3— centralise line. This key will alter the current line you are on so it is in the exact centre of the screen/paper. It can be used to place a title in the correct place.
- f4— alter line spacing. This key moves you between single/double line spacing.
- f6— prints up what looks like a jumble of dots on the screen but represents a £ sign. It is in fact CHR\$185 and is interpreted by the GP-100A printer as a proper pound sign. If you need to this routine can be altered to a different value or deleted altogether for your particular printer.
- f8— prints out address number 1. I suggest you alter the program so that this is your work address.
- f9— Print out address number 2. I suggest you make this one your home address.

NOTE: With both f8 and f9 the screen is cleared completely and the cursor ends at the correct place to add the date (i.e. for a letter).

The program is readily adaptable and should allow a good deal of improving. What I would really like to see is this adopted as an on-going project. If you feel there is a feature you need added to this then please as well as altering your own program write to us and tell us exactly what you did. Keys f5 and f7 have been clear for your own use. I now personally use this utility a good deal.

Please remember that this program is copyrighted by LASERBUG and can be used only for members own purposes. All rights are reserved.

You will find keyboard overlays for wordprocessor towards the back of LASERBUG.

Paul Barbour

### LIST

```

10REM          WORDPROCESSOR
20REM
30REM Written by Paul Barbour
40REM
50REM          Version 1.1
60REM
70REM          15/9/82
80REM
90REM          (C) LASERBUG 1982
100REM
110
120
130REM * SET UP *
140ON ERROR PROCEND
150REM * Set screen *
160*TV255,1
170REM * Make cursor keys return
ASCII values *
180*FX4,1
190REM * Add 128 to ASCII values
for soft keys *
200*KEY0!!!A
210*KEY1!!!B
220*KEY2!!!C
230*KEY3!!!D
240*KEY4!!!E
250*KEY6!!!M
260*KEY8!!!F
270*KEY9!!!L
280REM * Set screen and colour *
290MODE0
300VDU19,0,3,0,0,0,19,1,0,0,0,0
310REM * Set up variables needed
*
320T%=10
330P%=1
340DIM L(80)
350REM * Set small letters *
360?216=48:PRINT:VDU26
370REM * No scrolling *
380?875=2
390REM * Alter cursor *
400VDU23,0,10,96,0,0,0,0,0,0,0,0
410
420

```



```

430REM ***** START *****
440
450
460REPEAT
470REM * Keyboard scan *
480C=GET
490REM *** Abnormal situations ?
***
500
510REM * Carriage Return/Line Fe
ed *
520IFC=13THENVDU13:PROCLF:GOTO48
0
530REM * Cursor move *
540IFC>135ANDC<140THENC=C-128:GO
T0790
550REM * Tabulator *
560IFC=9THENPRINTSPC(T%-1):GOTO
480
570REM * Clear Screen *
580IFC=129THENCLS:GOTO480
590REM * Clear Line *
600IFC=130THENVDU13:PRINTSPC(80)
:VDU11,11:GOTO480
610REM * Tabulator Reset *
620IFC=131THENPROCtab_change:GOT
0480
630REM * Centralise Heading *
640IFC=132THENPROCcentralise:GOT
0480
650REM * Dump screen *
660IFC=135THENPROCprint:GOTO480
670REM * Alter line spacing *
680IFC=133THENPROCline_alter:GOT
0480
690REM * Address # 1 *
700IFC=134THENPROCaddress_1:GOTO
480
710REM * Address # 2 *
720IFC=140THENPROCaddress_2:GOTO
480
730REM * Pound sign for Printer
(CHR#135) *
740IFC=141THENVDU185:GOTO480
750
760REM * Near end of line beep *
770IFPOS>70THENSOUND1,-15,(POS/2
0)*50,2
780REM * Print character to scre
en *
790VDUC
800UNTILFALSE
810
820
830REM * PROCEDURES *
840REM * End of Program - reset
computer *
850DEFPROCend *FX4,0
860VDU3
870*FX15
880?216=32
890?875=0
900END
910REM * Change Tabulator settin
g *
920DEFPROCtab_change
930VDU123:T1=GET:VDUT1:T2=GET:VD
UT2,125,32,63
940Q#=GET#:IFQ#="Y"ORQ#="y"THENT
%=(T1-48)*10+(T2-48):PROCwipe:EN
DPROC
950IFQ#="N"ORQ#="n"THENPROCwipe:
GOTO920:ELSE940
960REM * Wipe Tab setting commen
ts *
970DEFPROCwipe FORE=1TO6:VDU127:
NEXT:ENDPROC
980REM * Centralise heading *
990DEFPROCcentralise A%=135
1000FORX=0TO80:L(X)=32:NEXT
1010VDU13:FORX=1TO80:L(X)=(USR(&F
FF4)AND&FF00)/&100:VDU9:NEXT
1020A1=0:REPEATA1=A1+1:UNTILL(A1)
<>32ORA1>=80
1030VDU13
1040A2=81:REPEATA2=A2-1:UNTILL(A2
)<>32ORA2=0
1050LGTH=A2-A1
1060TA=(80-(LGTH))/2
1070VDU11,13:FORX=1TO80:VDU32:NEX
T
1080VDU11,13:FORX=1TOTTA:VDU32:NEX
T:FORX=(A1-1)TOA2:VDUL(X):NEXT
1090ENDPROC
1100REM * Dump screen to Printer
*
1110DEFPROCprint C=GET:IFC<>135TH
ENENDPROC
1120*FX15
1130VDU26,2
1140FORY=0TO31
1150FORX=0TO79
1160cell=(USR(&FFF4)AND&FF00)/&10
0
1170VDU1,cell,3,9,2
1180NEXT:NEXT
1190PRINT
1200VDU3,127
1210*FX15
1220ENDPROC
1230REM * Line feed amount *
1240DEFPROCCLF IFP%=1THENVDU10:END
PROC:ELSEVDU10,10:ENDPROC
1250REM * Alter line feed amount

```



```

*
1260DEFPROCline_alter IFP%=1THENP
%=2:ENDPROC:ELSEP%=1:ENDPROC
1270DEFPROCaddress_1 CLS
1280
1290REM **** Add your own (work
???) address here ****
1300
1310PRINTTAB(55);"LASERBUG,"
1320PRINTTAB(58);"4 Station Bridg
e,"
1330PRINTTAB(61);"Woodgrange Road
,"
1340PRINTTAB(64);"Forest Gate,"
1350PRINTTAB(67);"London,"
1360PRINTTAB(70);"E7 ONF."
1370PRINT'TAB(55);
1380ENDPROC
1390DEFPROCaddress_2 CLS
1400
1410REM **** Add your own (home
???) address here ****
1420
1430PRINTTAB(55);"10 Dawley Ride,"
"
1440PRINTTAB(58);"Colnbrook,"
1450PRINTTAB(61);"Slough,"
1460PRINTTAB(64);"Berks.,"
1470PRINTTAB(67);"SL3 0QH."
1480PRINT'TAB(55);
1490ENDPROC

```

(See back cover for overlays)

## bookreview

*The BBC Micro Revealed* by Jeremy Ruston  
£7.95 from Interface Publications

The first thing you must notice about this book is the price—when you consider the manual costs £10, £7.95 for a 144 page book must seem way over the top. In my opinion it is far too much but you can be comforted by the fact that from most bookshops the book can be bought considerably cheaper.

This book isn't to be bought by the newcomer to the BBC Micro—once you have got to grips fully with the computer and understand most things it is of much more use. Most of the book is concerned with using indirection operators to get affects in areas such as graphics. The book is extremely useful and gives a great deal of hints but in all honesty you must be completely confident before you attempt to tackle it.

There are four sections in the book—the 6845 CRTC (which runs in conjunction with the ULA and handles graphics), memory locations (concerned mainly with the VDU drivers), BASIC program storage and BASIC variable storage.

The first section takes up a fifth of the book and is concerned with just one chip—the 6845. This is one of the most powerful chips of its kind made by Motorola. It is capable of producing up to 132 columns by 50 lines which shows you how versatile it is. Most of its features can be altered under software control although some need extra hardware. The way to alter this chip is using VDU23 (which is what you do when you get rid of the cursor). There are 18 registers that you can play around with and most of them can be altered. Anyway back to the book. Firstly this

section describes how the chip works both in other simpler computers and then the Beeb. Then there is a description of all 18 registers and the uses they can be put to. The section ends in how to design your own screen modes. Some of the things that you can pick up from this section are:

- \* How to alter the number of characters a line (e.g. how to get 42 characters in MODE7!) and get a slanted display
- \* Move the edge of the screen left and right
- \* Cursor control
- \* Move the whole screen in any direction instantly

You couldn't really call any of this useful but it is certainly nice to know.

The second section gives details of useful memory locations which can be altered using the indirection operators (? and !) The area described ranges from &320 to &399 which is used by the VDU drivers. Many of the locations are useful although there are some errors in this section and I am not sure whether the addresses will be the same for the new OS. It was extremely interesting to read this as the author as well as describing the addresses describes how he managed to find them. From the second section you can find out:

- \* How to stop the screen from scrolling without the problems of VDU5
- \* How, when you clear the screen in MODE7, instead of having a blank screen (i.e. full of spaces) you can have any character
- \* Setting colour masks
- \* Switch the LED's on and off (see last month's LASERBUG as well)

These are only a few things picked at random. The book gives much more useful information as well e.g. co-ordinates of screen origin, cursor, windows, colours etc. This section takes up 1/2 of the book and arguably contains the most information.

The third section takes up a mere 5% and describes how your program is actually stored. There is nothing of much use said here although it makes interesting reading.

The final 1/4 of the book looks at variables. Most of it is how Jeremy found out how they were stored but it ends with a program to perform the LVAR function (List VARIables) found on the bigger computers.

My review above may have left you in two minds as to whether this book is of any use to you. If you feel that you have mastered the manual then *The BBC Micro Revealed* has got information that will take you further. I found it extremely useful and it helped me improve one or two programs. Certainly for any price it is thin on pages and has too much blank space but it should be judged on content and not size. I would personally recommend this book but it should be read in peace and quiet as there is a great deal to understand if the BBC Micro was your first experience with computers.

Paul Barbour

## competition 2

How did you get on with last month's competition? By the time you are reading this the final entry date would have passed so we will announce the two winners in next month's magazine.

As you are no doubt aware we have printed two questionnaires in LASERBUG and two of the questions asked about when you ordered/when did you receive your BBC Micro. The competition this month will hopefully help me tabulate the data.

What I want is a program that will work out exactly how long people have been waiting for their computer. The program should first ask when the person ordered the computer then when they received it. After this the computer should give the difference between the two dates in *days*. Although you do not have to worry about leap years as we are only interested in 1981/2 you must remember the different amount of days each month and the jump from 1981 and 1982. A program that gives the results in colour is not as important as a neat, structured program.

The final date for entry is 15th November and the prize is 3 months free subscription to LASERBUG. Remember winning isn't as important as actually entering.

Paul Barbour



On this page we are going to try to bring together all the little hints and tips we are sent or discover ourselves. However, all this would grind to a halt if you do not write to us so, if you find out something that would make all our lives easier then please write to us, at the usual address, marking the envelope P/C. Alternatively, if you have a programming problem write to us because, if you have a problem, the odds are that somebody else has the same problem.

The first contribution this month is from Dr. D. E. Susans. As well as merging the \*SPOOL command can be very useful when using one program to generate a second program or DATA for a second program. The listing below is an example of a program producing 3 DATA statements at line numbers 1000, 1010, 1020. These DATA statements each contain 10 random numbers generated at lines 30-50. These are then assembled with the necessary line numbers and DATA headings at lines 80-150. The \*SPOOL statements at lines 70 and 160 cause the required new statements to be stored when the program is run. There are no unwanted error messages such as those which occur when using the "merge" method shown in the USER GUIDE.

Please note the "," in line 120, used to separate the data as well as the ; for the same line. It is also necessary to have one item outside the loop (line 140) so that the whole line does not terminate in a ",". Care should be taken so that the maximum line length for a BASIC statement is not exceeded as there is no check on this while recording.

The method of appending programs shown on p.403 of the USER GUIDE is simpler than the method described in the latter part of the above mentioned LASERBUG article. Not stated in the USER GUIDE is what happens if the appended program does not have higher line numbers than the first entered program.

When entered, the original line numbers are retained. If the program is now renumbered, new line numbers are given in order of the stored lines, but any GOTO or GOSUB references are not changed and generate error messages. These can then be easily changed. This method can be useful if the renumbering and recording is a nuisance.

```
>MODE7
>LIST
10REM Producing DATA using SPOOL
20DIM D(29)
30FOR I%=0 TO 29
40D(I%)=RND
50NEXT
60A%=1000
70*SPOOL"DATA"
80FOR K%=0 TO 20 STEP 10
90PRINT A%;"DATA";
100A%=A%+10
110FOR I%=K% TO K%+8
120PRINT D(I%);";";
130NEXT
140PRINT D(I%)
150NEXT
160*SPOOL
>
>
>
>RUN
RECORD then RETURN
1000DATA1.17565224E9, 326202096,-1.63422603E9, 87679
2588,-1.23196648E9,1.10140709E9,-1.02512702E9,-1.11283889E
9,-402335733, 964878237
1010DATA-1.32168375E9,1.40624264E9,-1.32343482E9, 12
1994792,1.41349538E9, 696590256,1.16139918E9,-1.17201346E9
,-1.69526717E9,-1.99518314E9
```

```
1020DATA2.05022881E9, -46215435,-1.83813776E9,-89143
6157, 961991252,-242342350,-1.7005131E9, 251211190, 363329
409,1.9742015E9
>
>
>*EXEC"DATA"
> 1000DATA1.0288137E9,-1.18166673E9,1.34093563E9,1.99
934812E9,-2.12150456E9, 105604110, 895832401,1.33639279E9,
-602475544, 20314599
> 1010DATA1.59413274E9,-418219280,-735694790, 1520907
64, 251698358, 239808191,-1.24476313E9,1.00919034E9,-29676
4411, 216501964
> 1020DATA -23132017,-1.88275181E9,-1.33955447E9,1.48
071812E9,-1.28645514E9, -39637110,1.27776846E9,-1.25587384
E9,-1.79939529E9,1.0211512E9
```

Mr. P. A. Hirst of Malvern Link, Worcs., informs us of two hints. If you suffer from a very noisy picture on UHF which takes the form of large diagonal bars hurtling through the screen colours, the effect can be minimised by slowly adjusting the trimmer located in the PAL encoder of the micro. It sits about 1½" away from the UHF modulator and seems to drift a little with age. Ever wondered how to get the Beeb's sound to come out through the TV? Mr. Hirst says after using the Atari whose sound comes out of the TV as standard, having it emerge from a 1½" speaker within the BBC Micro was something of a comedown. All that was necessary in this case was to come off the speaker and into the audio in socket of the TV.

If I may digress from P/C for a moment, many people have been mystified as to why Acorn chose to use an internal speaker instead of the TV. The thinking is that the graphics capabilities of the BBC Micro are such that most people eventually will be using a monitor to get a better quality picture. Monitors of course have no facility for sound.

From the wordprocessor program that appears elsewhere a few little programming routines came up. You will remember I said in the first Programmers Corner that \*KEY "double-bar"! "double-bar" followed by a letter produced a teletext control code. In actual fact the double-bar part adds 128 to the ASCII value of the following letter. Hence if you want a ASCII code to be produced different from every other key (like in the wordprocessor) this is the method that can be used. There have been several long programs that have been written that do exactly the same thing which are now redundant.

Supposing you do not want the screen to scroll at all—the method you would probably use is VDU5. This is fine for graphics but text handling is then made much more complicated. All you need to do to stop scrolling is ?875=2. When you try it the effect is startling—scrolling is stopped but you can control, tabulate and edit text as normal. ?875=0 will switch you back to scrolling.

There seems to be somewhat of a mystery to some people about using the TAB key. The TAB key returns the ASCII value 9. It is identical therefore to Cursor Right, PRINTCHR\$(9) or VDU9.

From what I saw last month a good number of people have now bought joysticks for their micro. Next month we will be having a big feature on them but for now try entering the program below.

```
LIST
10MODE7
20VDU23;8202;0;0;0;
30REPEAT
40PRINTTAB(0,0);CHR#129;"Channe
l 0 = ";ADVAL(0);" [ FIRE BUTTONS
"
50PRINT'CHR#130;STRING$(39,"-")
60PRINTCHR#131;"Channel 1 = ";F
```



```

NJSTK(1);" [ LEFT/RIGHT (#1) "
  70PRINT'CHR#134;"Channel 2 = "
;FNJSTK(2);" [ UP/DOWN (#1) "
  80PRINT'CHR#130;STRING$(39,"-")
  90PRINTCHR#131;"Channel 3 = ";F
NJSTK(3);" [ LEFT/RIGHT (#2) "
  100PRINT'CHR#134;"Channel 4 = "
;FNJSTK(4);" [ UP/DOWN (#2) "
  110PRINT'CHR#130;STRING$(39,"-")
  120UNTIL0
  130DEFFNJSTK(N)=INT(ADVAL(N)/256
)

```

With this you can experiment a great deal. Channel 0 is used for the fire button, 1 for left and right for joystick 1, etc. The values given by the program are between 0 and 255 (channels 1-4 only).

Finally for this month J. Nell of Molsey, Surrey, enjoyed the Life program from issue 3 but prefers spaces to fill unoccupied squares rather than: If you agree then he offers the following alterations:

Change the ":" in line 38 by CHR\$160

Change the ":" towards the end of line 69 with CHR\$160

Change the 58 in the middle of line 62 to 160

If you have any hints or tips about the BBC Micro that are original (i.e. have not already been published) please let us know as this page will only work if we hear from you.

Paul Barbour

## machine code

### A TOUCH OF MACHINE CODE

I have to confess that I have shamefully neglected my BBC machine, mainly because I have been working with a SPECTRUM (the Other Channel!) During this effort, I was asked if I could make the BBC machine beep when each key was pressed, as the Spectrum does, and the more I thought about the problem, the more interesting it became. You see, I've been working, off and on, with the design of a very simple program to produce and edit text — it's too simple to glorify with the name of a "word-processor". It uses MODE7, because I need all the memory I can get for storing text, and it can't afford to use up memory for things like editing, so I just use the normal editing facilities of the machine, and store my text with line numbers as if each line were a line of BASIC. This way, the cassette operating system will deal with it more reliably anyhow, editing is easy, and I use a little bit of peeking to ensure that line numbers don't get printed out — this article is being typed using the system.

One problem, however, is that I tend to keep my head down, and since my chosen method dictates that I must type just two lines in MODE7 to fill one line of print, I became aware of a need for some audible reminder of when I was approaching the end of a line of printing, which is the end of every second line on the screen. As a result, I started to get into the machine-code business once again.

As it happens, even the provisional guide (all I have to date) gives some useful addresses, one of which is &FFE3 which writes the character in the accumulator, and the other of which is &210, which is a sort of Clapham Junction in RAM where an address is stored (actually, it's in 210 and 211) that the machine uses to direct it on its way each time a key is struck. My first thought, then was to intercept this process, so that each time a key was struck, the machine would branch to my own program. This appeared to work, and the next problem was to produce a beep each time. At this point, I found out how intelligently the machine is designed compared to earlier machines I have used. The beep is normally produced in BASIC by using one of the VDU commands, 7 to be precise.

This, and any other VDU command can be put into machine code simply by loading the number into the accumulator of the 6502, and calling the subroutine at FFE3. Before I did this, I would have to save the content of the accumulator on the stack, otherwise some very odd things would happen.

The result was:

```

LIST
  10 DIM P% 50
  20 [ .START
  30 PHA:LDA#7:JSR &FFE3:PLA:JMP
&DFA5
  40 ]
  50 ?&210=START: ?&211=START DIV
256

```

Line 10 sets aside 50 bytes (more than I need) of memory for the program, with P% acting to set the program counter at the start of this piece of memory. The program saves the accumulator on the stack, loads in the number 7, puts it out to the operating system so that the beep is produced, and then restores the accumulator. It's very simple and it works. For an alternative method of reserving memory:

```

>LIST
  10 HIMEM=HIMEM-50:P%=HIMEM
  20 [OPT0: .START
  30 PHA:LDA#7:JSR &FFE3:PLA:JMP
&DFA5
  40 ]
  50 ?&210=START: ?&211=START DIV
256

```

These programs remain in memory when the escape key is pressed, but they are removed by the BREAK key. The form of the machine code produced by the program is:

```

2FCE          OPT3
2FCE          .START
2FCE 48          PHA
2FCF A9 07      LDA#7
2FD1 20 E3 FF   JSR &FFE3
2FD4 68          PLA
2FD5 4C A5 DF   JMP &DFA5

```

Now for the next problem. The obvious method was to test each byte as it came in, and reset a memory location if it was the return byte, &0D. Alas, the obvious method did not work, because the return byte does not seem to be routed through the address stored at 210 and 211. The option I chose was to test for any byte less than 20 (hex), which is the space, and reset memory address 70H if this was so. If the number was greater, indicating a character, then the memory address 70 is incremented and tested. If its contents exceeds 75 (I later used 72), the beep sounds for each character thereafter until a return is struck.

```

LIST
  10 DIM A 50:OSASCII=&FFE3
  20 ?&70=0
  30 Count=&70:FORPASS=0TO3STEP3:
P%=A
  40 [OPT PASS
  50 .START PHA:CMP#&1F:BPL CTN

```



```

60 LDA#0:JMPOUT
70 .CTN INC Count
80 LDA Count: CMP#75: BMI OUT
90 PHA: LDA#7: JSR OSASCI: PLA
100 .OUT STA Count
110 PLA: JMP &DFA5
120 ]
130 NEXTPASS
140 ?&210=START: ?&211=START DIV
256
150 END
>A

```

These are, by any standards, trivial routines, but they do illustrate some useful points. One is how easy it is to create machine-code routines on the BBC Machine. Another is that they show how addresses for the start of routines are put into memory — by poking the label word, and the label DIV 256, which gives the upper byte, into the memory spaces. The other thing is the use of OPT. This has been selected as 0 in the first example because there's not much point in printing a listing, but I have used two options in the second program. One is for a pass with no error messages. This is because the program uses jumps to labels which haven't been allocated in the first pass. Suppressing the error messages allows a second pass, in which these labels have been allocated addresses and assembly can proceed normally, printing code and any error messages that may be needed:

```

0F2C          OPT PASS
0F2C 48          .START PHA
0F2D C9 1F      CMP#&1F
0F2F 10 05      BPL CTN
0F31 A9 00      LDA#0
0F33 4C 45 0F   JMPOUT
0F36 E6 70      .CTN INC Count
0F38 A5 70      LDA Count
0F3A C9 4E      CMP#75
0F3C 30 07      BMI OUT
0F3E 48          PHA
0F3F A9 07      LDA#7
0F41 20 E3 FF   JSR OSASCI
0F44 68          PLA
0F45 85 70      .OUT STA Count
0F47 68          PLA
0F48 4C A5 DF   JMP &DFA5

```

When the routine is tested, of course, the options can be changed to 0 or 2, in which no listings are printed.

It's a small start, but at least it's a start, and it's another routine for my book on 6502 Programming for the BBC Computer (some day, after the BASIC book has been launched!)

Ian Sinclair

## show review

The Personal Computer World Show at the Barbican last month was from the reports I have been getting the biggest computer show in the world. The attendance on the Saturday was just 100 less than that of the entire show last year!

Access into the Barbican's exhibition halls was very limited. Also did you notice the very low ceiling. The reason so I was told is that in actual fact the two exhibition halls are both converted car parks! Considering the traffic of people I saw I am not surprised.

LASERBUG appeared at the show in the ACC Club Avenue which was on the top floor of exhibition hall A. On the first day we had two problems — power and magazines. We had set up the computer and just loaded a demo program in. The time was 9.40 and suddenly we lost all power — not just us but the whole ACC section. At 9.50 power was restored and the program was reloaded. At 9.55 the power went off yet again. After the show had been going for 25 minutes we eventually got power back for the third and hopefully final time. The culprit so we were told was somebody in the Chess Feature overloading the power supply.

Our other setback was our display. On the walls of our stand we stuck magazines up all round the sides with sellotape. The only problem was that the exhibition was so hot all the sellotape lost its stickiness. That in short meant that every other minute you had a magazine fall on your head — not a very good idea when you are trying to encourage people to join!

I felt at the show there were three main attractions — the BBC Micro, Spectrum and Dragon. Throughout the whole show every time you looked up you always saw at least one person carrying either joysticks, Acornsoft programs or the folder pack. A good many people were even walking away with BBC Micro's — one or two model B's!!!

Acorn did have a stand at the show although to be honest I thought it was rather bad. It was fine if you wanted to try out one of the Acornsoft games — they had a series of machines all connected up by Econet (from what I saw they had a couple of problems with it). If you wanted advice then you were much better off going to one of the BBC User groups at the show. Most of the time there was just one person answering problems — on the Saturday somebody told me they had waited two hours to go and see him! You could buy most of the Acornsoft range on this stand which I thought was rather bad. This is not because they were selling it at the show — that is what I would expect. What I did find unacceptable is that they gave priority to making money instead of providing a good service. Acornsoft has (or had) a huge backlog of orders and I personally would have thought that they'd have tried to get that down first. It is obvious that the programs were ready well before the show and hence the release must have been purposely delayed in order to make more money. Considering the BBC Micro's poor track record I would have thought Acorn's motto should be Service First.

Acorn dealers were well represented. They had their own section marked up Acorn Village. Also a couple were outside this area like Bug-Byte. These stands were some of the busiest at the whole show. One of the more hectic ones were Microage who were the people selling joysticks. Most of the dealers did very well and provided a good range of items for the Beeb.

I said last month that I thought I would spend most of my time talking about LASERBUG's delays — surprisingly I was wrong. Although I did have some people complain only one person in four days went away unhappy — most people were just glad to see we were still going. I must thank all of you who took the effort to come and see us.

The main thing people were complaining about was still that they hadn't received their micro. It must have upset them to see people walking away with the machines at the show! A good number of people seemed interested in buying a printer although several people came and asked if we had a screen dump program for an Epson — see LASERBUG issue 3 (a machine code version of this is following shortly!).

In general I enjoyed the PCW Show. It was much better than last year's and the presentation was better than the IPC Computer Fair. I look forward to next year. The next show we are planning to attend at present is the IPC one in June next year.

As well as all those who came and saw us I must thank Maureen, Mark, Keith (1), Keith (2), Fred, Howard, Julie, Doris, Gladys, four members of the ACC — David Annal, Bazyle Butcher, Norman Fox, Vernon Gifford and finally Liz for her moral support.

See you all at the next show . . .

Paul Barbour



This spot always gets low reviews because it is basically specialist. However as a good number of schools subscribe to LASERBUG that alone makes this spot worthwhile. This month we have a request to make to all you heads of computer departments out there. If you are a pupil please stick this section under the nose of the appropriate teacher.

Now all teachers will know how hard it is to get good educational software especially for a fairly new computer such as the BBC Micro. The Educational Publishers Council is researching into the spread and use of microcomputers in schools in order to provide guidance for publishers interested in this field to provide more appropriate software. It is extremely hard to gather information and hence the EPC has asked us for details of certain things to do with computers in education. As we obviously have no records of the kind of information required I decided to put out a request to you direct.

Whether you are a teacher in a primary school or a University you can help the EPC to get more information and in return better educational software is likely to come on to the market. Hence could you please answer the following questions on headed notepaper if possible and send them to us marking the envelope EDUCATION.

- (i) What type of educational establishment are you?
- (ii) Please list the quantity of each type of computer your establishment has.
- (iii) Please list any computers you have on order.
- (iv) What percentage are your computers used exclusively for
  - a) Admin.
  - b) Computer Studies
  - c) CAL
  - d) Information Retrieval.
- (v) Re-answer Q.4 but for shared access.
- (vi) Are there any changes developing in this pattern?
- (vii) In hours/week what is the class use for
  - a) Computer Studies,
  - b) CAL,
  - c) Information Retrieval.
- (viii) Re-answer Q.6 for small groups.
- (ix) Re-answer Q.7 for individuals.
- (x) Are there any noticeable changes developing in this pattern?
- (xi) Have you any other comments on availability, usage, etc.

Remember if you can take the time to answer these questions we all may benefit in the long run.

If you would like to write an article on the use of the BBC Micro in your school go ahead and we would be pleased to publish it.

Finally after great demand from the PCW Show we are planning to print a series of educational programs in the near future.

## get more colours

### HOW TO GET MORE COLOURS OUT OF YOUR BBC MICRO

The small program by Mr. A. E. Frigard of Reigate, Surrey, printed in *Programmers Corner* in issue 3 to produce more colours out of your BBC Micro was predictably extremely well received. At the PCW Show last month people actually came and asked if they could "buy the copy that told you how to get more colours." Hence this month we decided to devote an article to this topic all by itself.

Out of the many programs we have received on this topic I have selected out two that you may find interesting. The first one helps you make up the colours and the second demonstrates the feature.

Mr. P. A. Hirst of Malvern Link, Worcs., wrote the first of the two selections below. The program asks you to input an "actual colour" number between 0 and 7 (see user guide) and displays a bar of it across the screen. A second number is supplied and a second bar is drawn about 1" below the first. The intervening space is then filled with a mix of the two colours. This allows you to experiment more easily than with our original program. The mode of operation is very simple.

```

LIST
10CLS
20PRINTTAB(5,10)"SELECT THE PAL
ETTE COLOUR..."
30INPUTTAB(9,13)"(BETWEEN 0 AND
7) "A
40PRINTTAB(32,13)"AND"
50PRINTTAB(0,19)"SELECT THE COL
OUR YOU WISH TO MIX..."
60INPUTTAB(9,13)"(BETWEEN 0 AND
7)"TAB(36,13)B
65IFA<0ORB<0ORA>7ORB>7GOTO10
70MODE1
80K=0
90IFA=0ORB=0THENK=A+B+1
100IFK=7ORK=8THENK=A+B-1
110VDU19,0,K,0,0,0:CLG
120X=100:Y=800
130PROCmixcolour(X,Y,A,1)
140Y=600
150PROCmixcolour(X,Y,B,2)
160X1=X+1100:Y=700
170PROCadd(X,X1,A,1)
180X=104
190PROCadd(X,X1,B,2)
200PRINTTAB(5,20)"Press the SPAC
E BAR to continue"
210A#=GET#:IFA#=""VDU19,0,0,0,0
,0:CLG:GOTO10ELSE210
220DEFPROCmixcolour(X,Y,Z,CH)
230VDU19,CH,Z,0,0,0:GCOLOR,CH
240MOVEX,Y:MOVEX,Y+100:PLOT85,X+
1100,Y+100
250MOVEX+1100,Y:PLOT85,X,Y
260ENDPROC
270DEFPROCadd(X,X1,col,CH)
280VDU19,CH,col,0,0,0:GCOLOR,CH
290FORI=X TOX1 STEPS
300MOVEI,Y:DRAWI,Y+100
310NEXTI
320ENDPROC

```

The other program is written by Dr. D. E. Susans who is now a regular contributor to LASERBUG. How many colours is it possible to produce on the BBC Computer? This program shows just a few hundred of the many thousand possible. The colours are not put onto the screen using the plot commands since this would be far too slow. Instead they are pushed directly to the appropriate screen addresses (lines 1190/1190), screen scrolling having been stopped with a ?875=2 command (guess who had a preview of *Programmers Corner*... Ed.) Each area of colour is made up of groups of four points in a square formation. The basic computer colours are used for these points. In this manner, it is possible to generate 64K "colours" in MODE2 and 256 "colours" for each of the 70 possible non-flashing "actual-colour" combinations used in MODES 1 & 5. In the full range of colours, many will have only minor differences, many will be striped (some similar to those obtained by overranging GCOLOR). For this program, a selection has been made which minimises the stripes and duplications.

In MODE2 the last block of 25 colours uses "flashing-colours" at a maximum flash rate (110, 120) to simulate a grey added to the colour. It should be noted that any of the MODE5 colours can be generated in



MODE2 (by a suitable different data number) with no restriction on simultaneous display). Many of these colours are different from those shown in the MODE2 display.

A Model A computer with its restricted memory cannot handle MODES 1 & 2 and so lines 110-420 and 1300-1390 inclusive should be omitted and line 100 changed to read GOTO590.

The program cannot be RENUMBERED without changing the addresses of the data blocks contained in the last figure of the PROCblock statements. This procedure sets up the colour constants whilst FNcol sets the screen start address and the colour block format. Details are given in the REM statements at the end of the program. If any DATA statement contains too few numbers then an error will be generated at line 700. Knowing the MODE and the number of blocks drawn it is easy to find the deficient DATA line.

The DATA statements contain four-character HEX numbers, the first two figures control the top two points of the colour whilst the second two control the lower two points. For MODES 1 & 5 each of the figure pairs and made up by summing (HEX) the numbers for one left-hand dot number and one for the right-hand dot number as given in the table below:

MODES 1 & 5		
COLOUR	Left-hand Dot	Right-hand dot
0	00	00
1	0A	05
2	A0	50
3	AA	55

In MODE2 each of the figure pairs is made up by summing (HEX) the numbers up to four different colours (including flashing) for the left-hand and right-hand dots, the numbers are given below:

MODE 2		
COLOUR	Left-hand Dot	Right-hand Dot
Red	02	01
Green	08	04
Blue	20	10
Flashing	80	40

For detailed information on the screen address layout reference should be made to one of the many articles on screen format. One suitable reference is The BBC Micro Revealed by Jeremy Rushton published by Interface.

It should be noted that, because of the method of forming these new colours and the limitation of the PAL coding system, there will be severe cross-colour effects (moving diagonal coloured stripes) in some areas with some colours. In addition some colours (particularly dark reds) will be weak. These deficiencies do not exist when an RGB colour monitor (or RGB receiver) is used—the colours are then very clear and bright.

```
>C
10 DIM C1%(256),C2%(256)
20 MODE7: REM "HOW MANY COLOURS ?" BY D.E.SUSANS. (
C) 1982
30 VDU23;11,0;0;0;0 :?875=2
40 PRINT TAB(10,7);CHR$(141);CHR$(130);"HOW";CHR$(129
);"MANY"CHR$(131);"COLOURS";CHR$(132);"?",TAB(10,8);CHR$
(141);CHR$(130);"HOW";CHR$(129);"MANY"CHR$(131);"COLOURS
";CHR$(132);"?",TAB(18,11);CHR$(133);"BY"
50 PRINT TAB(14,15);CHR$(134);"D.E.SUSANS",TAB(13,19)
;"JULY 1982 (C)."
```

```
,12);"To go back to start of changes",TAB(5,14);"for MOD
ES1 or 5 press RETURN",TAB(5,21);"Press any LETTER to
continue.":A%=GET$
80 CLS
90 #FX15,0
100 MODE 2:VDU20:?875=2 :REM Model A Change this line
to read GOTO590
110 #FX9,1
120 #FX10,1
130 VDU23;11,0;0;0;0:PRINT TAB(7,31);"MODE2";:PRINT TA
B(2,12);"MODE 2"" a 16"" colour"" mode"
140 AD%=&3280: REM 110,340 6#5#5 BLOCK
150 PROCblock(25,290)
160 AD%=FNcol(AD%,5,2,5,8,2)
170 PROCblock(25,300)
180 AD%=AD%-&17C0
190 AD%=FNcol(AD%,5,2,5,8,2)
200 PROCblock(25,310)
210 AD%=FNcol(AD%,5,2,5,8,2)
220 PROCblock(25,320)
230 AD%=FNcol(AD%,5,2,5,8,2)
240 PROCblock(25,330)
250 AD%=AD%-&1A40
260 AD%=FNcol(AD%,5,2,5,8,2)
270 PROCblock(25,340)
280 AD%=FNcol(&4B80,5,2,5,8,2)
290 DATA 0,&200,&201,&301,&303,4,&204,&601,&309,&703,
&408,&608,&609,&709,&70B,&40C,&60C,&60D,&70D,&70F,&C0C,&
E0C,&E0D,&D0F,&F0F
300 DATA &2303,&321,&1201,&210,&2000,&723,&1309,&611,
&1204,&2004,&170B,&729,&1609,&61B,&241B,&170F,&170D,&160
D,&160C,&140C,&1F0F,&F1D,&1E0D,&E2C,&1C0C
310 DATA &1F2F,&1F2D,&1E2D,&1E2C,&2C0C,&271F,&172D,&1
E26,&192C,&240C,&271B,&1719,&1926,&1618,&1824,&231B,&231
9,&1225,&1224,&1024,&1323,&1321,&1221,&1220,&1020
320 DATA &3313,&1331,&3211,&1230,&3010,&331B,&3319,&3
219,&3214,&301B,&371B,&361B,&3619,&3618,&3814,&372C,&372
E,&1E39,&362C,&342C,&3F2F,&1F3E,&1E3D,&1E3C,&3C2C
330 DATA &3030,&3230,&3231,&3331,&3333,&3034,&3234,&3
631,&3339,&3733,&343B,&363B,&3639,&3739,&373B,&343C,&363
C,&363D,&373D,&373F,&3C3C,&3E3C,&3E3D,&3F3D,&3F3F
340 DATA &8DA,&2DA,&22DA,&20DA,&28DA, &ADA,&177A,&377
A,&1D7A,&1F7A, &DA,&2ADA,&E5DA,&157A,&3F7A, &1E7B,&1C7B,
&3C7B,&3E7B,&3D7A, &167B,&147B,&347B,&367B,&357A
350 PROCwait
360 CLS
370 G%=2
380 REM BLOCK OF 35
390 MODE 1:?875=2:COLOUR 2:PRINT TAB(7,31);"MODE 1.
A 4 colour mode.":COLOUR3
400 AD%=&3280
410 F%=16
420 G%=2
430 VDU23;11,0;0;0;0
440 VDU 19,2,2,0,0,0
450 VDU 19,3,4,0,0,0
460 VDU 19,0,0,0,0,0
```



```

470 PROCblock(35,490)
480 AD%=FNcol(AD%,7,4,5,F%,G%)
490 DATA 0,&A,&50A,&FOA,&FOF,&A0,&AA0,&5A5,&5A0F,&FAF
,&50A0,&5AA0,&5AA5,&5FFA,&AAF,&50F0,&5AF0,&5FFF,&5FAF,&A
AA,&F0F0,&FFFF,&55FF,&55AA,&AA,&F0F5,&50F5,&FAF5,&A555,&
A5FA,&A055,&F5AA,&F5FF,&F5AF,&A55F
500 Z%=0
510 C00%=0
520 C01%=1
530 C02%=2
540 C03%=3
550 PROCc
560 IF Z%=1 GOTO 500
570 CLS
580 IF G%=1 GOTO 20
590 MODE5 :?875=2:COLOUR 2:PRINT TAB(1,31);"4 colours.
MODE 5";:COLOUR3
600 AD%=&5940
610 F%=8
620 G%=1
630
640 GOTO430
650
660 DEF PROCblock(M%,Data)
670 LOCAL I%,R%
680 RESTORE Data
690 FOR I%=1 TO M%
700 READ R%
710 C1%(I%)=R% DIV &100
720 C2%(I%)=R% AND &FF
730 NEXT
740 ENDPROC
750
760 DEF PROCwait
770 VDU5
780 T%=500
790 X%=640:X1%=0
800 Y%=512:Y1%=0
810 MOVE X%,Y%
820 W%=ASC(INKEY$(T%))
830 IFW%=13 THEN Z%=1:ENDPROC
840 IFW%<>32 THEN ENDPROC
850 #FX15,0
860 T%=5000:GOTO820
870 ENDPROC
880
890 DEF PROCc
900 IF?&367=1 THEN A%=11 ELSE A%=1
910 REPEAT
920 VDU19,0,C00%,0,0,0
930 VDU19,1,C01%,0,0,0
940 VDU19,2,C02%,0,0,0
950 VDU19,3,C03%,0,0,0
960 VDU4
970 PRINT TAB(A%,30);"COLOUR Nos. ";C00%;",";C01%;",";
;C02%;",";C03%
980 VDU5

```

```

990 PROCwait
1000 IF Z%=1 THEN ENDPROC
1010 C03%=C03%+1
1020 IFC03%>=8 THEN C02%=C02%+1:C03%=C02%+1
1030 IFC02%>=7 THEN C01%=C01%+1:C02%=C01%+1:C03%=C02%
+1
1040 IFC01%>=6 THEN C00%=C00%+1:C01%=C00%+1:C02%=C01%
+1:C03%=C02%+1
1050 UNTIL C00%>=5
1060 VDU20
1070 ENDPROC
1080
1090
1100 DEF FNcol(AD%,J%,D%,E%,F%,G%)
1110 LOCAL JAZ,EAZ,DAZ,LAZ,FAZ,FBZ,I%
1120 I%=1
1130 FBZ=8#F%
1140 FAZ=FBZ-1
1150 FOR JAZ=1 TO J%
1160 FOR EAZ=1 TO E%
1170 FOR DAZ=1 TO D%
1180 FOR LAZ=AD% TO (AD%+FAZ) STEP 2
1190 ?LAZ=C1%(I%)
1200 ?(LAZ+1)=C2%(I%)
1210 NEXT
1220 ADZ=AD%+&140#G%
1230 NEXT
1240 I%=I%+1
1250 ADZ=ADZ+FBZ-DZ*&140#G%
1260 NEXT
1270 ADZ=ADZ+DZ*&140#G%-FBZ#E%
1280 NEXT
1290 =AD%
1300 REM M% DATA ENDS AT C1,Z%(M%)
1310 REM Data LINE NUMBER FOR DATA
1320 REM C1%( ) TOP LINE OF COLOUR PAIR a,b
1330 REM C2%( ) BOTTOM LINE OF C. PAIR c,d
1340 REM AD% SCREEN START ADDRESS
1350 REM J% DIFFERENT (COLOUR) BLOCKS HIGH
1360 REM D% #8 LINES HIGH IN EACH BLOCK
1370 REM E% BLOCKS WIDE
1380 REM F% MODES 1&5 DOT QUADS WIDE,MODE2 DOT PAIRS W
IDE
1390 REM G% =2 FOR MODES 1&2, 1 FOR MODE 5 (ADDRESS MUL
TIPLIER)

```

## cassette filing system

Many of you may be used to the Grandfather/Father/Son/Master file system which is generally a method adopted by the business world. Dr. Susans however uses a version of this on his BBC Micro.

When developing long programs, it is very easy to press a wrong key and lose all of your work. Such a loss can be minimised by the effective use of a cassette recorder. The method I have found to be best requires the use of four common cassettes + cassettes for the final working program. These cassettes are labeled as follows:

1. Development cassette (C60)



2. Day cassette (C60)
3. Final cassette (C12)
4. Archive cassette (C12)
5. Working program cassette, etc.

In use, the development cassette is used to SAVE the program say every 20 minutes or whenever a significant stage has been reached i.e. entering a large section of the program. I use a single letter followed by a number as a title, the numbers being in sequence for that program. For this tape I only record once and do not normally check the recording. All programs here are recorded on the same tape. The tape is only rewound if necessary to reload a program. When one side is full the tape is turned over and the other side overwritten. I do not keep any record of the tape contents other than the last title number.

At the end of a session or when changing over to work on a different program I SAVE the program on the Day tape, normally three times, and checking one of the recordings. This is the recording used to re-enter the program for the next session. This day tape is used in the same way as the Development tape. When it is believed that the program is complete and working satisfactory the program is also SAVED on the Final and Working cassettes. This latter tape is the one normally used when it is required to RUN the program and would not normally hold more than two or three different programs.

When the program has been in use for several weeks without change and I am fully satisfied that there should be no further changes to the program and that it is worth keeping then I SAVE it on the Archive cassette and permit the Final cassette copy to be overwritten. The Archive cassette should be put away and only used if necessary to replace the Working cassette or add a further program. Full records of the contents of the Final, Working and Archive cassettes should be kept.

If only a small amount of work is carried out at any one time, then the Development and Day recordings could be made on the same cassette.

Dr. D. E. Susans

## circles galore

If you have a mathematical background then something like drawing a circle is an easy task. However, not all of you have mathematical ability to that extent. If you think SIN is something to do with the church and COS an example of bad English then carry on reading.

In a branch of mathematics known as trigonometry there are functions known as sines (SIN on your computer) and cosines (COS). Their derivation is not important here.

For the complete beginner (and there are such people out there) a circle can be divided up into 360 parts known as degrees ( $^{\circ}$ ). Hence a right angle (like a corner) is known as  $90^{\circ}$ .

Sines and cosines are functions or actions that can be performed on a number. If the number is 0, the sine of it is 0, if it is 90 the sine is 1, etc. Other values can be seen from the table below:

0 degrees becomes	0.00
30 degrees becomes	0.50
60 degrees becomes	0.87
90 degrees becomes	1.00
120 degrees becomes	0.87
150 degrees becomes	0.50
180 degrees becomes	0.00
210 degrees becomes	-0.50
240 degrees becomes	-0.87
270 degrees becomes	-1.00
300 degrees becomes	-0.87
330 degrees becomes	-0.50
360 degrees becomes	-0.00

This can be seen more clearly from a graph. Enter and run the program below:

```
>LIST
10 MODE4
20 MOVE0,512
30 FORX=0TO1280STEP4
40   DRAWX,SINRAD(X)*512+512
50   NEXT
60 END
```

The graph goes on for ever as you can see. We are only interested in one "period" of the graph and so change the following line:

```
>LIST40
40 DRAWX,SINRAD(X/3.5)*512+512
```

OK so these are sines—what about cosines? In actual fact a cosine is really a sine but is shifted over by  $\frac{1}{4}$ :

```
>LIST
10 MODE4
20 MOVE0,1023
30 FORX=0TO1280STEP4
40   DRAWX,COSRAD(X/3.5)*512+512
2
50   NEXT
60 END
```

If you alter the programs so one graph is drawn on top of the other then you should be able to see the potential for drawing graphs.

You have probably noticed that the word RAD was added onto both SIN and COS. You will remember earlier I described degrees as a circle divided up into 360 pieces. This is very easy for a human to work in but computers work mainly in radians. Why not use radians directly you may ask? Instead of a circle divided up into 360 parts, with radians it is divided into 6.28318530716 parts. We add RAD so the computer converts one to the other.

Anyway, back to the circle. After we have added a few adjustment factors the program to draw a circle looks like:

```
LIST
10 MODE4
20 radius=510
30 x_adjust=640
40 y_adjust=512
50 MOVE640,1023
60 FORangle=0TO360STEP4
70   DRAWSINRAD(angle)*radius+x
   _adjust,COSRAD(angle)*radius+y_adj
ust
80   NEXT
90 END
```

For a procedure slightly more useful enter the listing below:

```
>LIST
1000 DEFPROCcircle(radius,x_coord
,y_coord)
1010 VDU29,x_coord,y_coord;
1020 MOVE0,radius
1030 FORangle=0TO360STEP4
1040   DRAWSINRAD(angle)*radius,C
OSRAD(angle)*radius
```



```
1050 NEXT
1060 ENDPROC
```

The listing itself is self-explanatory but note the use of VDU29... to change the graphics origin. So far all the circles produced have been outline circles—the penultimate procedure gives you a solid one instead:

```
>LIST
1000 DEFPROCcircle(radius,x_coord
,y_coord)
1010 VDU29,x_coord,y_coord;
1020 MOVE0,radius
1030 FORangle=0TO360STEP30
1040 MOVE0,0
1050 DRAWSINRAD(angle+30)*radius
,COSRAD(angle+30)*radius
1060 DRAWSINRAD(angle)*radius,C
OSRAD(angle)*radius
1070 PLOT85,0,0
1080 NEXT
1090 ENDPROC
```

As a final procedure, this method does not have to be restricted to drawing circles—it can be used to draw any polygon. In actual fact a circle is defined as a polygon of infinite sides. With PROCpolygon shown below simply add the number of sides to the other parameters.

```
LIST
1000 DEFPROCpolygon(sides,radius,
x_coord,y_coord)
1010 VDU29,x_coord,y_coord;
1020 step=360/sides
1030 MOVE0,radius
1040 FORangle=0TO360STEPstep
1050 MOVE0,0
1060 DRAWSINRAD(angle+step)*rad
ius,COSRAD(angle+step)*radius
1070 DRAWSINRAD(angle)*radius,C
OSRAD(angle)*radius
1080 PLOT85,0,0
1090 NEXT
1100 ENDPROC
```

The possibilities you can develop from here are endless. For example see Seasons elsewhere in this issue.

Paul Barbour.

## help!

*Help* is the title of these few lines and exactly what we need is help. LASERBUG does not write itself (more's the pity) and as well as producing the magazine there is a great deal of "behind-the-scenes" work involved e.g. administration.

The first thing I would like is people to help in the general running of the user group. Just because you are a beginner that does not mean there isn't a useful job you could do. It would be easier if you were local to Colnbrook, Berks. (Heathrow Airport) area as keeping in touch is made simpler but wherever you live you can still aid us.

Next as you know there are several computer exhibitions in a year that LASERBUG attend. Our stands at such affairs have to be manned all the time and so we need volunteers to come and hand out magazines and

generally chat to people. This is very hard work and needs several people all the time. The only bonus of doing this is you get to see the show for nothing but you earn that privilege just being on the stand for an hour. The next show we are attending at present is in mid-June but it is nice to have a list of people we can call on to help.

The third way you can help us is the most important. We need you to contribute to the magazine. You do not need to write a full-size article (although that would be nice) but a few hints and tips scribbled down on a bit of paper and sent to us is just as useful. Also if you buy either software, hardware, books or whatever and you have an opinion on your purchase — be it good or bad — then write it up in the form you have seen in the rest of LASERBUG and we will print it — all the reviews to date have been my opinion only.

Every member has something to offer and LASERBUG will only flourish if we get feedback from you. If you have 5 minutes to spare then why not consider helping us? As well as helping us you can help yourselves. If you require a reply to any letters you send, please include an SAE (that means both Stamped and Self Addressed Envelope). Many people who have written to us would have received no answer because of ignoring this fact.

Finally, to save us time when sorting the mail please write in the top left-hand corner one or two words that describe what the letter is about e.g. HELP, ARTICLES, PROGRAMS, BACK ISSUES, PROBLEMS, etc.

Thank-you...

Paul Barbour

## hardspot

This month's *Hardspot* is all about the printer and other input/output ports. It should be of use to all those of you who are desperately trying to connect up your daisywheel printers and the like.

There appears to be considerable confusion about the pin numbering of the connectors on the underneath of the computer. Some of this is probably due to the fact that access to these connectors is from the underside of the printed circuit, the opposite side to that commonly used. In all cases, pin 1 is marked by a small arrow and is at the opposite end of the socket to the power supply. Manufacturers of the plugs use at least three different ways of marking the pins. Some mark one row with odd numbers and the other row with even numbers, some one row in sequence followed by the other row, whilst others mark the rows in sequence with the two rows having a and b suffixes. The easiest way to avoid problems is to number the conductors in a ribbon cable attached to the plug in sequence—this is how Acorn appear to number the plugs.

When using the parallel printer port, alternate conductors in a ribbon cable are connected to earth at the computer and act as screens between the data lines. For a CENTRONICS compatible interface, these conductors should be connected at both ends of the cable as some printers use these conductors to give a different input.

Thus conductor 1 should go to Centronics pin 1

conductor 2	to	pin 19 (opposite pin 1)
conductor 3	to	pin 2
conductor 4	to	pin 20 (opposite pin 2)
etc....		

It is not necessary to use 26 conductor cable, 20 conductor cable is adequate as the last 6 pins are not used.

Serial printers use the RS423 port. There are three connections from the computer 5 pin socket on the rear. The centre pin is the earth return pin. The one at the bottom towards the power supply the data pin and the bottom pin towards the r.f. socket the Clear To Send (CTS) pin. For the computer to be able to transmit data, there must be a positive voltage on this CTS pin. One common problem is that some printers can be set internally to have either polarity signal on this pin. It is then necessary to set the computer to the serial data mode with a \*FX5,2 command and the Baud rate with a \*FX8,x command. Then if CTRL-B or VDU2 is followed by a PRINT statement the printer should print.

Dr. D. E. Susans







**SUPPLIER:** Micro-Aids, 2 Boston Close, Culcheth, Warrington, Cheshire. 092-576 2804.

**MATERIAL:** Polyester/Cotton.

**PRICE:** £3.25 (including VAT, P & P).

**COMMENTS:** The dust cover comes in a small compact package (210mm × 130mm) and opens up into a tightly fitting cover. It is in a fawn colour which complements the computer and has no logo on it anywhere neither for the BBC, Acorn or even Micro-Aids. There is no label sewn onto the cover and hence no easy indication of the material or washing instructions. It covers the computer completely except for the sockets at the back which enables you to keep the cover on while the computer is running (which is what I did at the PCW Show).

**FITTING:** Tight and firm.

**LOOKS:** Good.

**STRENGTH:** Good.

**MICRO USABLE WHEN COVER ON:** Yes.

**ANTI-STATIC:** Yes.

**SPLASHPROOF:** Any splashes are absorbed evenly over the affected area. It is not completely splashproof but any splashes will not leak through (the splashproof test is performed using a teaspoon of water).

**WATERPROOF:** No (the waterproof test is initially performed with a tablespoon).

**CLEANING:** Machine washable at 50°C.

**OVERALL:** This cover provides adequate protection for day-to-day use. It would not stand up to a spilt cup of coffee but how often do you go around spilling coffee all over your computer? The price is very reasonable and I feel all computer owners should buy some sort of cover — £3.25 is little to pay to protect a £400 computer.

Paul Barbour

## club reports

This month *Club Reports* looks at the North London BBC Microcomputer Users Group and Education Workshop.

The group is run by John Claydon of Wood Green, London. The meetings run are "positive and structured" and held at the Bounds Green Junior School in Park Road, N11. This is close to both Bus and Underground services and has a large car park in the school playground. The club was primarily set up to study aspects of the BBC Microcomputer, provide mutual aid and comfort (!) and "do it together" (!!!). They offer aid for beginners, tuition for others and challenges for experts.

The entire group would ideally be non-profit making and hence cost nothing to attend the meetings. However, due to the costs in things like hiring the school, etc., a small fee has to be charged. This is said never to be higher than £1. One day John Claydon hopes that the group will develop "saleable products and services" and hence become financially independent.

What are the objectives of the group? Their initial objectives are for regular meetings for Owners and Users to discuss, develop and exchange information and software. "Stop re-inventing the wheel" they say "share the burdon of developing published programs." They want to try to share facilities and equipment, swap magazines and books and to create an Econet Network with printer, mega-storage, prestel and telesoftware. Other objectives for the future are to explore and overcome the current limitations of hardware and software, organise seminars, demonstrations, exhibitions, newsletters and competitions. "How much will we achieve" they ask — "that's up to you. The group is run by the members for the members".

And what if you decide to go? Well first pick up your Micro, TV, monitor, software etc., and take that with you because that is the only way a club such as this can really run effectively. The time table for every meeting is:

2.00 Welcome. Set up equipment. Ad hoc demonstrations.

2.30 Workshop/Seminar then discussion and demonstration.

4.00 Projects, Competitions and administration.

5.00 Clear-up and Clear-off.

For the November meeting, "Graphically Put" is the theme with talks on statistics, colour, art and highlights. In December, "Out of Thin Air" is the title with explanations and discussions of Telesoftware and Prestel. The program for next year includes ports and paddles; machine code; subroutines and utilities (hopefully they mean procedures); interpreters and compilers; applications; file handling; the Tube (should it ever arrive); benchmark programmes; monitoring and control.

All in all the group seems extremely well organised and I would recommend anyone in the area to attend. The North London BBC Microcomputer Users Group and Education Workshop is now officially affiliated to LASERBUG. Unfortunately there is no such thing as free entry as was explained in the text.

I offer John Claydon and his group the best of luck for the future which I think for them will be very bright.

Paul Barbour

## disassembler

For all you machine code addicts below we present a 6502 disassembler for the BBC Micro. It was written by Nicholas Goodwin of Horley, Surrey, to whom I am thankful.

```
10 REM
      Simple 6502 disassembler
```

by N.GOODWIN

```
20 MODE7
30 PRINT "Start address, in hex
: &";
40 P#="&":FOR I=1 TO 4
50 REPEAT:G=GET:G#=CHR$G
60 IF G=127:P#=LEFT$(P#,LEN(P#)-
1):VDU127:I=I-1
70 UNTIL(G#>="0"AND G#<="9")OR(G
#>="A"AND G#<="F")
80 PRINT G#;:P#=P#+G#
90 NEXT:PRINT ""
100 P=EVAL(P#)
110 REPEAT
120 PRINT TAB(0,23);~P
130 N=?P
140 PROC OUT(1,N)
150 X=(NAND3)+1
160 Y=(NDIV32)+1
170 Z=(NDIV4)AND7)+1
180 PRINT TAB(14,23);
190 ON X GOSUB 290,910,1090:ELSE PRI
NT "NOP ?"
200 PRINT TAB(0,24)
210 P=P+1
220 UNTIL GET#="Q"
230 REPEAT
240 PRINT "Any more (Y/N) ? ";
250 G#=GET#:PRINT G#
```



```

260 IFG#="N" THEN END
270 UNTIL G#="Y"
280 GOTO 30
290 ON ZGOTO 300, 390, 470, 560, 660, 7
20, 770, 860
300 ON YGOSUB 310, 320, 330, 340, 350,
360, 370, 380: RETURN
310 PRINT "BRK": P=P+1: PROCOUT(2, ?
P): RETURN
320 PRINT "JSR": PROCDE: RETURN
330 PRINT "RTI": RETURN
340 PRINT "RTS": RETURN
350 PRINTTAB(14, 23) "NOP ?": RETUR
N
360 PRINT "LDY": PROCIM: RETURN
370 PRINT "CPY": PROCIM: RETURN
380 PRINT "CPX": PROCIM: RETURN
390 IFY=1 OR Y=3 OR Y=4 PRINT "NOP ?":
RETURN
400 ON Y-4GOSUB 420, 430, 440, 450: EL
SEGOSUB 460
410 PROCDO: RETURN
420 PRINT "STY": RETURN
430 PRINT "LDY": RETURN
440 PRINT "CPY": RETURN
450 PRINT "CPX": RETURN
460 PRINT "BIT": RETURN
470 ON YGOSUB 480, 490, 500, 510, 520,
530, 540, 550: RETURN
480 PRINT "PHP": RETURN
490 PRINT "PLP": RETURN
500 PRINT "PHA": RETURN
510 PRINT "PLA": RETURN
520 PRINT "DEY": RETURN
530 PRINT "TAY": RETURN
540 PRINT "INY": RETURN
550 PRINT "INX": RETURN
560 IFY=1 THEN PRINT "NOP ?": RETURN
570 IFY=4 THEN PRINT "JMP( ": PROCDE:
PRINT " )": RETURN
580 ON YGOSUB 860, 600, 610, 860, 620,
630, 640, 650
590 PROCDE: RETURN
600 PRINT "BIT": RETURN
610 PRINT "JMP": RETURN
620 PRINT "STY": RETURN
630 PRINT "LDY": RETURN
640 PRINT "CPY": RETURN
650 PRINT "CPX": RETURN
660 PRINT "B": ON YGOSUB 1520, 1530,
1540, 1550, 1560, 1570, 1580, 1590
670 P=P+1: N=?P
680 PROCOUT(2, N)
690 IFN>&7F THEN N=N-&100
700 PRINTTAB(18, 23) "L&": ~(N+P+1)
710 RETURN
720 IFY<5 OR Y>6 THEN PRINT "NOP ?": R
ETURN
730 IFY=6 THEN PRINT "LDY" ELSE PRINT
"STY"
740 PROCDO
750 PRINT ", X"
760 RETURN
770 ON YGOSUB 780, 790, 800, 810, 820,
830, 840, 850: RETURN
780 PRINT "CLC": RETURN
790 PRINT "SEC": RETURN
800 PRINT "CLI": RETURN
810 PRINT "SEI": RETURN
820 PRINT "TYA": RETURN
830 PRINT "CLV": RETURN
840 PRINT "CLD": RETURN
850 PRINT "SED": RETURN
860 IFY<>6 THEN PRINT "NOP ?": RETUR
N
870 PRINT "LDY"
880 PROCDE
890 PRINT ", X"
900 RETURN
910 ON YGOSUB 1010, 1020, 1030, 1040,
1050, 1060, 1070, 1080
920 ON ZGOTO 930, 940, 950, 960, 970, 9
80, 990, 1000
930 PRINTTAB(17, 23) "( ": PROCDO: PR
INT ", X)": RETURN
940 PROCDO: RETURN
950 IFY=5 THEN PRINTTAB(14, 23) "NOP
?": RETURN ELSE PROCIM: RETURN
960 PROCDE: RETURN
970 PRINTTAB(17, 23) "( ": PROCDO: PR
INT " ), Y": RETURN
980 PROCDO: PRINT ", X": RETURN
990 PROCDE: PRINT ", Y": RETURN
1000 PROCDE: PRINT ", X": RETURN
1010 PRINT "ORA": RETURN
1020 PRINT "AND": RETURN
1030 PRINT "EOR": RETURN
1040 PRINT "ADC": RETURN
1050 PRINT "STA": RETURN
1060 PRINT "LDA": RETURN
1070 PRINT "CMP": RETURN
1080 PRINT "SBC": RETURN
1090 ON YGOSUB 1480, 1490, 1500, 1510:
ELSEGOTO 1160
1100 ON ZGOTO 0350, 1110, 1150, 1120, 35
0, 1130, 350, 1140
1110 PROCDO: RETURN
1120 PROCDE: RETURN
1130 PROCDO: PRINT ", X": RETURN
1140 PROCDE: PRINT ", X": RETURN
1150 PRINTTAB(17, 23) "A": RETURN
1160 Y=Y-4
1170 ON ZGOTO 01180, 1220, 1290, 1340, 1
370, 1380, 1420, 1440

```



```

1180 IFY<>2THENPRINT"NOP ?":RETURN
N
1190 PRINT"LDX"
1200 PROCIM
1210 RETURN
1220 ONYGOSUB1250,1260,1270,1280
1230 PROCD0
1240 RETURN
1250 PRINT"STX":RETURN
1260 PRINT"LDX":RETURN
1270 PRINT"DEC":RETURN
1280 PRINT"INC":RETURN
1290 ONYGOTO1300,1310,1320,1330
1300 PRINT"TXA":RETURN
1310 PRINT"TAX":RETURN
1320 PRINT"DEX":RETURN
1330 PRINT"NOP":RETURN
1340 ONYGOSUB1250,1260,1270,1280
1350 PROCDE
1360 RETURN
1370 PRINT"NOP ?":RETURN
1380 ONYGOSUB1250,1260,1270,1280
1390 PROCD0
1400 IFY<3THENPRINT",Y"ELSEPRINT"
,X"
1410 RETURN
1420 IFY=1THENPRINT"TXS"ELSEIFY=2
THENPRINT"TSX"ELSEPRINT"NOP ?"
1430 RETURN
1440 ONYGOSUB1370,1260,1270,1280
1450 ONYGOTO1470,990,1460,1460
1460 PROCDE:PRINT",X"
1470 RETURN
1480 PRINT"ASL":RETURN
1490 PRINT"ROL":RETURN
1500 PRINT"LSR":RETURN
1510 PRINT"ROR":RETURN
1520 PRINT"PL":RETURN
1530 PRINT"MI":RETURN
1540 PRINT"VC":RETURN
1550 PRINT"VS":RETURN
1560 PRINT"CC":RETURN
1570 PRINT"CS":RETURN
1580 PRINT"NE":RETURN
1590 PRINT"EQ":RETURN
1600 DEFPROCOUT(PL,CH)
1610 PRINTTAB(2+3*PL,23);:IFCH<&1
0THENPRINT"0";
1620 PRINT;~CH
1630 CH=CHAND&7F
1640 PRINTTAB(30+2*PL,23);
1650 IFCH>=32ANDCH<127VDUCHELSEVD
U255
1660 ENDPROC
1670 DEFPROCIM
1680 P=P+1
1690 PROCOUT(2,?P)

```

```

1700 PRINTTAB(18,23)"#&";~?P
1710 ENDPROC
1720 DEFPROCD0
1730 P=P+1
1740 PROCOUT(2,?P)
1750 PRINTTAB(18,23)"&";~?P;
1760 ENDPROC
1770 DEFPROCDE
1780 P=P+2
1790 PROCOUT(2,?(P-1))
1800 PROCOUT(3,?P)
1810 PRINTTAB(18,23)"&";~(&100*?P
+?(P-1));
1820 ENDPROC

```

## conversion for RGB inputs

If you are interested in any type of colour display for your computer and have used a colour monitor you will not be very satisfied with a normal colour television display. The inherent limitations of the PAL system severely limit the available definition, do not give a good colour rendering in areas of fine detail, have considerable cross-colour effects i.e. green-magenta or blue-yellow moving diagonal stripes (as seen on check suits etc.) as well as some limits on black and white definition (can you use MODE0?). These colour limitations can be removed if RGB Inputs can be used, the black and white definition can also be improved.

Although it is not practical to modify receivers of old designs which use discrete components and colour difference signals, there are now some newly designed colour receivers which use integrated circuit PAL decoders and which can be modified comparatively easily for RGB inputs. These receivers are usually designed so that Teletext can be easily fitted but are not actually fitted (the Teletext inputs are used). One such series of receivers is the Ferguson range of receivers which incorporate the TX10 chassis and this article describes the necessary modifications. Similar modifications can be applied to any receiver which uses either a TDA3560 or TDA3561 PAL DECODER IC (but does not incorporate Teletext). If the receiver does not use an isolating power supply then it will be essential to fit an isolating transformer, the Ferguson receivers do not require this.

**IT IS IMPORTANT THAT YOU ARE USED TO WORKING ON TELEVISION RECEIVERS IF YOU WISH TO CARRY OUT THESE MODIFICATIONS AS IT IS EASY TO DO CONSIDERABLE DAMAGE TO BOTH YOURSELF AND THE RECEIVER IF YOU ARE NOT FAMILIAR WITH THIS WORK.**

The first modification is to change the mains lead for a 3-core lead and earth the chassis. **FAILURE TO DO SO CAN NOT ONLY GIVE A POSSIBLY FATAL SHOCK BUT COULD SEVERELY DAMAGE THE COMPUTER.** The other modifications fall naturally into three groups—the connecting cable, the colour inputs and the synchronizing input.

For the cable feed to the receiver, I would suggest a 6-pin socket similar to the one found on the computer and mounted on the back of the receiver near to the aerial socket. There is a cut-out for a larger socket in this position with a corresponding knock-out in the case. For the cable to the computer, I used a 5/16" dia. 8-core cable with the spare conductors connected to earth and a cable format such that earth (or +5v) conductors were between each of the colour and sync. signal lines. (This type of cable was purchased at Proops of Tottenham Court Road, London).

In the receiver, first identify the PAL DECODER IC, this is a 28-pin IN type TDA3560 or TDA3561 (identical connections) and is



mounted on the r.f. part of the chassis. The Teletext colour input signals go to pins 13(R), 15(G), 17(B) and a switching input to pin 9. In the TX10 chassis these pins are connected directly to a 6-pin plug on the chassis. In some types of receiver these colour inputs may be decoupled to earth by a capacitor, these must be removed. The inputs from the computer must be ~~XXXXXXXXXXXXXXXXXXXX~~ attenuated (see Fig. 1) to approximately 1V and isolated by capacitors. The 5V supply from the computer provides the switching signal.

In Teletext operation, the synchronizing pulses are obtained from the incoming signal, this signal must be replaced for computer operation. The detected vision signal leaves the vision i.f. module (a screened box approx. 4" x 2" x 1") on pin 8 and goes to test point A, after this the signal splits X into separate paths—to the sync separator, luminance, black level clamp and colour circuits, also a 5-pin plug. The lead from TP A should be broken at the wire link near to the test point and before any other leads branch away, this break is closed by an electronic switch for TV operation, the appropriate connections being by an electronic switch for TV operation, the appropriate connections being conveniently made to TP A and pin 1 of plug PL19, the other side of the break.

The actual switching is carried out by a CMOS switch type CD4053BE. This IC requires a 12V supply (at less than 1ma) and this

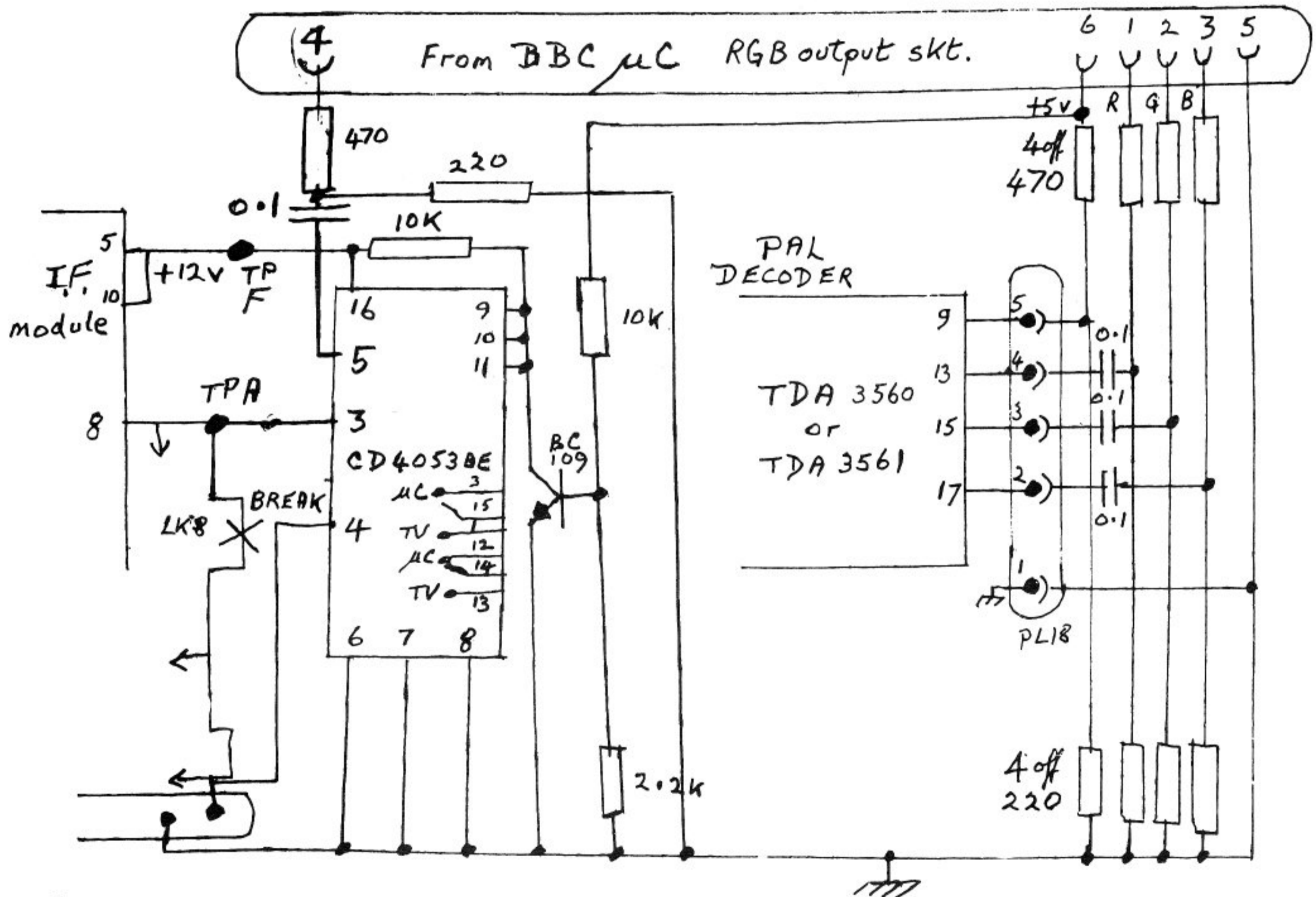
can conveniently be found on test point F (adjacent to TP A), this supply also goes to pins 5 and 10 of the i.f. module. The CMOS switch is driven by a NPN transistor (almost any type will do although a BC109 is shown here) and this transistor X is in turn driven by the 5V supply from the computer. It is important to keep the leads from this switch reasonably short so as to minimise stray capacitances which could effect the TV definition or give unwanted pick-up. There are two unused switches in the CMOS IC, these could be used to switch audio. If they are used for this purpose then it is necessary to bias the switched inputs to about +6V and use high impedance signals. The switches are not suitable for loudspeaker signals.

In use the receiver will switch automatically from TV to the computer when this is plugged in and switched on.

D. E. Susans

NOTE: LASERBUG does not accept any responsibility for anything that may happen while following the above article. It is correct to the best of our knowledge but NO MODIFICATIONS SHOULD BE MADE TO ANY TV EXCEPT BY AN EXPERIENCED ENGINEER. We accept no liability for any loss or damage.

FIG. 1



- Components  
 5 off 470 ohms  
 5 off 220 ohms  
 2 off 10K ohms  
 1 off 2.2K ohms  
 4 off 0.1 µf  
 1 off IC type CD4053BE  
 1 off NPN transistor e.g. BC109

Modification to FERGUSON  
 TX10 chassis (without TELETXT)  
 For BBC microcomputer RGB input



Due to popular demand we have been forced to start a back issues service. We can offer copies of all magazines except issue 1.

We are considering getting issue 1 of LASERBUG reprinted but are not sure whether it is really worth it. Hence if you would be prepared to buy an issue 1 please write to us with your name and address and we will put you on a special list. **DO NOT SEND ANY MONEY NOW FOR ISSUE 1.** If the demand is great enough then we will have it printed up and inform you of the cost through LASERBUG. We can offer a photocopy of this issue.

The cost of back copies are:

Issue 1 Photocopy only £1.60

Issues 2-4 £1.25 each

On top of this please either include an SAE of appropriate size and postage or add 50p for the first back issue and 25p for any further copies. We have sufficient quantities of all issues (except 1) although supplies of issue 3 are going down.

Please mark your envelope **BACK COPY** otherwise your order will be subject to delay.

Next months LASERBUG will be just as good as this month's I am pleased to say.

We have several reviews planned — software, the Amber printer, a look at monitors and books including Instant BBC MICRO Machine Code by Jeremy Rushton (yet again!)

The second seasonal program showing a firework display will be printed. Also we plan to have a feature on the new Joysticks. Due to demand we might be printing some educational programmes in a new series.

Programmers Corner will still be there giving you all the little hints and tips which are invaluable to good programmers.

As you can see from this month's magazine people other than myself are starting to write for LASERBUG at last. If you want to write for us then by the time you are reading this issue 6 will be at the printers. The Copy date for issue 7 is Monday 8th November.

If you have a few minutes you might like to try and enter our competition. The winners of the very first one will appear in the next issue.

Have fun with your BBC Micro over the next month. Incidentally no more corrections have come in for Labyrinth — does that mean we have it correct at last?

## LASERBUG SPECIAL OFFERS

As an added service to all readers of LASERBUG we present some special offers. These are available to anyone as long as the coupon below (or a photocopy of it) is sent with your order.

### COVERS FOR YOUR BBC MICRO — ONLY £3.25 EACH

For the all inclusive price of £3.25 you can purchase one of our BBC Computer dust covers specially made for LASERBUG. We are offering them to you at what we consider to be good value for money. Amongst their features is that they are (i) anti-static, (ii) machine washable, (iii) strongly made, (iv) tight fitting, (v) coloured so as to complement your micro, (vi) designed to allow the leads to stay in when the cover is in place, (vii) made of high-quality polyester/cotton which looks better than the less attractive plastic covers and (viii) sold to you from what you know to be a reliable source, us!

**STOP PRESS:** 5% discount on all goods from Dracal Ltd. including design sheets and support stands. More details follow next month....

Please send.....LASERBUG Computer Covers at £3.25 each to:

Name.....Address.....

I enclose a cheque/PO for £..... made payable to LASERBUG

PLEASE ALLOW 28 DAYS FOR DELIVERY



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