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Volume 6
June 1988
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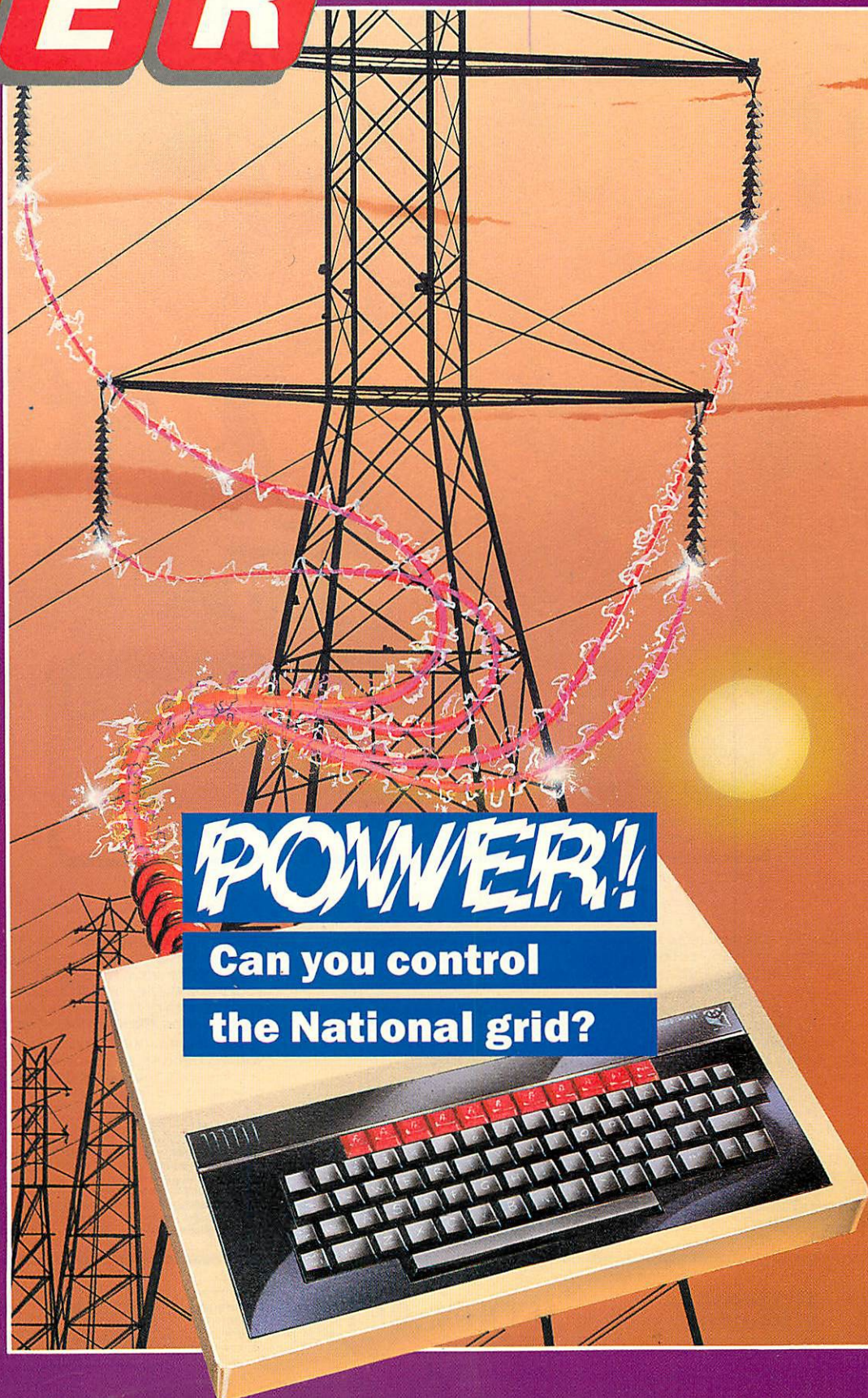
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Tel: 0625 878888 (All depts.)
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Telecom Gold: 72:MAG001
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Prestel Mailbox: 614568383
Fax: 0625 879966

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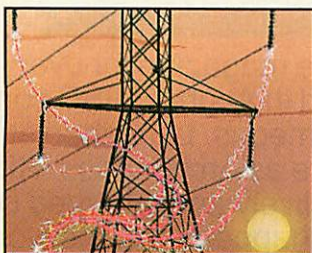
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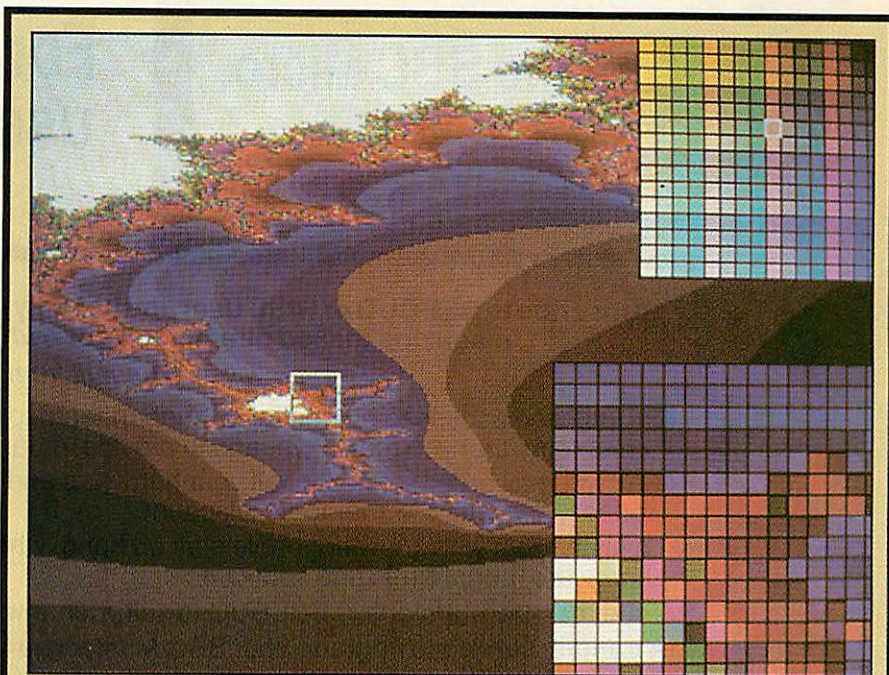
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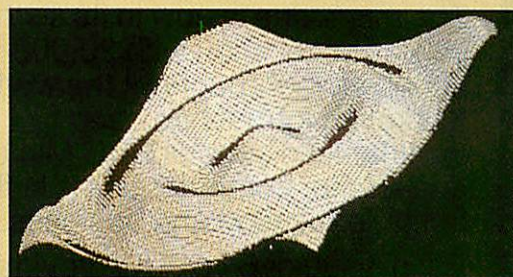
The software provided with Acorn's new Risc-based micro lacks the facility to change very fine detail on the full graphics screen. But it CAN be done, and on this month's 3.5in disc we present a handy mouse-driven routine which lets you do it. Using it you can touch up your displays in any mode to obtain superb pictures. The final results can be perfect right down to the last tiny detail. Find out all about it on Page 50.

**ARCHIMEDES
PIXEL EDITOR**

It's so easy to produce

3D SURFACES

with the listing on Page 89. And there's a special Archimedes version on this month's 3.5in disc.



You'll find the very latest software and peripherals for the complete Acorn range at the next Electron & BBC Micro User Show. There's so much to enjoy as Acorn in Action demonstrates some of the truly amazing projects powered by Acorn machines. Turn to Page 3 for full details of how to save money on your tickets to the greatest show yet.

MICRO USER CLASSIFIEDS

The best bargains in the world of the BBC Micro come from fellow readers of *The Micro User*. Turn to **Page 124** to find just what you're looking for – from cheap modems to complete computer systems.



All major listings in this issue are accompanied by a checksum to help overcome any typing mistakes. For full details of how they work, see the article on Page 28 of the February issue of *The Micro User*.

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Z88

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(as reviewed in December 87 Beebug)

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Control the beast

Andrew Moore shows how you can get more from your Z88 display

CAMBRIDGE Computer's new portable has been designed for a large number of uses, from word processing and electronic filofax to portable data entry ready to transfer to your BBC Micro. It certainly isn't a toy, but this is not going to prevent a large number of users from trying to add one more item to the list of Z88 roles – leisure.

With a view mainly to this potential use let's look at some simple, effective ways that the display can be brought under the programmer's control from Basic.

To start with, we can make simple use of the VDU command. Last month John Allen considered commands of the form VDU1,n where n is some number. To remind you, call up Basic on your Z88 and type VDU1,82. From now on you will find that characters output to the display are reversed. This will continue until you type VDU1,82 again, which will send you back to normal.

"Why 82?" This is because 82 is the Ascii code for the character R – for Reverse. To make life easier, it is probably best to let the machine do the converting for you by specifying the command as VDU 1,ASC"R".

Reversing characters is only the first in a whole series of bizarre things you can do to the output mode of the display discussed last month. The panel on the right summarises the effects available.

A command not mentioned was VDU1,127 which sets all toggles to the off position – 127 is

the Ascii code for Delete. This could be useful after setting your output to flashing reversed tiny text or whatever else has taken your fancy. Unfortunately it will also switch off the cursor and vertical scrolling, so you have to toggle them back on with VDU 1,ASC"C" and VDU 1,ASC"S".

A useful feature of VDU commands can save some typing here. Several short ones can be concatenated into a larger one, so for example, the three necessary to return the screen to normal can all be brought into one statement:

```
VDU 1,127,1,ASC"C",1,ASC,"S"
```

Even more useful is the fact that a sequence of

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Summary of Z88 VDU1 commands for effects

Bold text	VDU1,ASC"B" or VDU1,66
Cursor	VDU1,ASC"C" or VDU1,67
Flashing text	VDU1,ASC"F" or VDU1,70
Grey text	VDU1,ASC"G" or VDU1,71
Upper case lock	VDU1,ASC"L" or VDU1,76
Reverse text	VDU1,ASC"R" or VDU1,82
Vertical scrolling	VDU1,ASC"S" or VDU1,83
Tiny text	VDU1,ASC"T" or VDU1,84
Underlined text	VDU1,ASC"U" or VDU1,85
Horizontal scrolling	VDU1,ASC"W" or VDU1,87

```

10 REM User Defined Character Editor
20 REM by Andrew Moore
30 REM (c) The Micro User
40 PROCinit:REPEAT:PROCact:UNTIL FALS
E
50 DEF PROCinit
60 DIM V(7):FOR I=0TO7:V(I)=191:NEXT
70 CLS:WS="-":BS=CHR$127
80 INPUT"Which label for the UDC (Ent
er A to P)";XS
90 PROCdefine:CLS:PROCshow
100 FORX=0TO5:FORY=0TO7:PRINTTAB(X,Y);
BS;
110 NEXT:NEXT:X=2:Y=3:ENDPROC
120 DEFPROCshow
130 PRINT TAB(15,1);"The UDC Looks Lik
e this: ";
140 VDU 1,130,ASC"?",ASC XS
150 PRINT TAB(15,5);"To define: VDU1,1
38,ASC""",ASC""";XS;""";
160 FORI=0TO7:PRINT",";V(I);:NEXT
170 PRINTTAB(15,6);"To print: VDU1,13
0,ASC""",ASC""";XS;""";
180 ENDPROC
190 DEF PROCmove(dir)
200 IF dir=255 Y=(Y+7) MOD 8
210 IF dir=254 Y=(Y+1) MOD 8
220 IF dir=253 X=(X+1) MOD 6
230 IF dir=252 X=(X+5) MOD 6
240 ENDPROC
250 DEF PROCact
260 PRINTTAB(X,Y);
270 K=GET:IFK<>13 PROCmove(K):ENDPROC
280 P=2^(5-X):wasset=(V(Y)AND P)<>0:V(
Y)=V(Y)EOR P
290 IFwasset PRINT WS; ELSE PRINT BS;
300 PROCdefine:PROCshow:ENDPROC
310 DEF PROCdefine
320 VDU1,138,ASC""",ASC XS,V(0),V(1),V
(2),V(3),V(4),V(5),V(6),V(7)
330 ENDPROC

```

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Ascii codes can be stored in a string which you can get PRINT to send to the VDU driver. In this case we could use:

```
NORMAL$=CHR$(1)+CHR$(127)+CHR$(1)+"C"+CHR$(1)+"S"
```

Then whenever we want to get back to normal we just enter:

```
PRINT NORMALS
```

So far we have only looked at simple VDU commands. There is a wealth of more complex ones, a lot of them being valuable tools for a leisure programmer.

Here I only have space for a few: They all have more than one extra argument after the 1 in the VDU statement as in last month's window command. In this case the second argument indicates how many more the VDU driver can expect and we specify there will be *n* by the code 128+n. One such command is:

```
VDU 1,128+4,ASC"!",32+x,32+y,32+z
```

Here *x*, *y* and *z* are numbers between 0 and 223. This produces a sound, formed as a square wave of *y* 100ths of a second of low followed by *z* 100ths of a second of high, repeated *x* times. As an example try:

```
VDU 1,128+4,ASC"!",32+200,32+1,32+1
```

Another convenient command is:

```
VDU 1,128+3,ASC"N",32+x,ASC"<char>"
```

where *<char>* is a string one character long. It will be output *x* times.

Finally let's deal with the most useful VDU command of all – the one that allows you to design characters yourself. As a result, instead of games such as *Shoot down the Hs with the Xs* we will be able to have *Zap the mega-terror cozmoids with the lazer globules of death*.

On the unexpanded – no 128k ram in slot 1 – Z88 we can have 16 user-defined characters – UDCs – labelled A to P. They are six pixels wide and eight high and you program them by giving eight values between 0 and 63 with the *n*th corresponding to the *n*th row from the top.

Bit 0 – the least significant – of each value determines if the rightmost pixel of that row is set, while bit 1 defines the next rightmost. This

continues until bit 5 which defines the leftmost.

Let's look at the command to define a UDC labelled *<char>*. It isn't the smallest command in the world:

```
VDU 1,128+10,ASC"=",ASC"<char>",128+v0,128+v1,128+v2,128+v3,128+v4,128+v5,128+v6,128+v7
```

where *v0* to *v7* are the eight values. To print this new character you use:

```
VDU 1,128+2,ASC"?",ASC"<char>"
```

If you are planning to print this UDC several times it will aid efficiency and program legibility if you pack the sequence of codes into a string, as we did with *NORMAL\$*. For example, if *A* was the label, we could enter

```
UDCAS=CHR$(1)+CHR$(128+2)+"?"+"A"
```

This can then always be printed using:

```
PRINT UDCAS
```

Here is a cute programette to demonstrate a wild use of UDCs by filling the display with a random pattern of all eight of them, but continuously changing their definitions. Whenever one is changed, all instances of it on the display will also change:

```
10 REPEAT:Y=RND(7)+ASC"A":X=127+RND(64)
20 VDU 1,138,ASC"=",Y,191,X,X,X,X,X,X,1
91 : VDU 1,130,ASC"?",Y : UNTIL 0
```

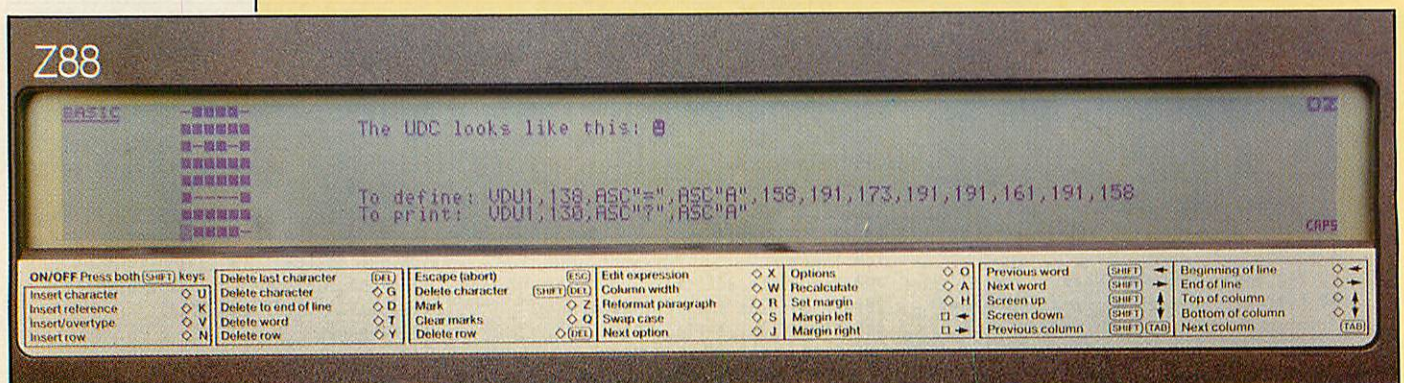
Worrying about bits can be tedious, so the listing gives a cheap and cheerful UDC editor. When you run the program you will be able to move a cursor around an 8 by 6 grid representing the character, and hitting Return toggles whether the current pixel is or isn't set.

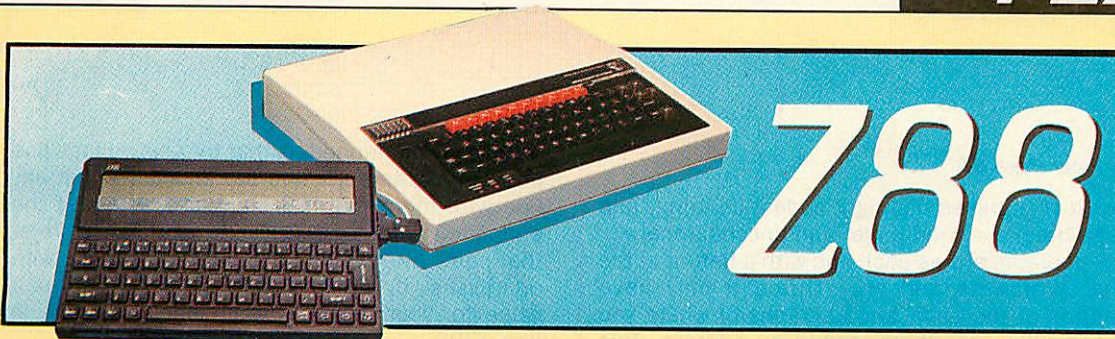
The UDC itself is displayed and updated automatically as you change it. Also displayed are the VDU commands necessary to define the character and print it, so when you are satisfied with your creation, you can jot down the commands to include in your own programs.

So we've looked at the primary ingredient for writing leisure software – control of the display. The other major topic is animation. Here the Z88 provides us with both intriguing problems and entertaining possibilities.

● *Next month we'll look at these points and also an implementation of a classic game of Breakthrough to demonstrate some of the Z88's potential.*

...a cheap and cheerful UDC editor





Trouble-free transfers

John Allen shows how to use Pipedream with other BBC Micro word processors

It could be said that one of the best reasons for having a Z88 and a BBC Micro is that the Z88's word processor, Pipedream, is also available on the BBC Micro as View Professional. However, this often works out to be more of a theoretical than practical advantage, since the latter is relatively expensive. So you're more likely to have one of the more established word processors such as Mini Office II, Wordwise, Wordwise-Plus, Inter-Word or View.

This raises the question: How easily can you use Z88 Pipedream files in the BBC Micro's other word processors? In the case of View it is fairly easy. Save the Pipedream document as plain text before transferring the file to the BBC Micro, then set up a matching ruler in View and READ the file in. The only snag is that you'll have lost the highlights.

For the others, the answer is not so simple because the files are stored in a different way. However, if you use Wordwise, Wordwise-Plus or Mini Office II here's a handy conversion program that gives the answer. Inter-Word has a much more complex, and unpublished, file structure so unfortunately files cannot be converted so easily.

Because Pipedream works so differently from Wordwise and Mini Office II it is necessary to follow some conventions when you are creating documents on the Z88 which you will later want to load into your BBC Micro word processor.

Firstly, you should only type text in column A and avoid using Tab to move to other columns. Secondly, there should always be a blank line between paragraphs, so that the conversion program can spot where they end. Finally, you cannot use expression slots, as the BBC Micro packages have no equivalents of the spreadsheet functions.

Wordwise and Wordwise-Plus owners should

type in Listing I. Mini Office II users need to type Listing I with the changes shown in Listing II. Save the program – Convert – before trying to run it.

You may have to change the highlight codes in Convert because the ones given in the data statements – lines 1600 to 1670 – assume that you have an Epson-compatible printer and use the eight standard highlights.

For other printers, or if you want to use different effects, you will need to enter the codes in the following order: Turn the highlight on, turn it off, then either Y – turn it off at the end of a line – or N – leave it on. Line 1600 corresponds to highlight 1, 1610 to the second and so on up to 1670, which corresponds to highlight 8.

The program allows you to convert a file already on your BBC Micro disc or, with a suitable serial connecting lead – see our offer on page 72 – it can take a Pipedream internal working file direct from the Z88.

If you are transferring from the Z88 you should note that a file – !!TEMP! – is created for temporary use.

The resulting page layout will be the same as in Pipedream, but if you've defined a header or a footer you'll find that the converter just copies the Pipedream definition – you'll need to correct that yourself before printing.

Not everything that can be done in Pipedream has a direct equivalent, so in these cases Convert ignores the command. The ones that it does translate from the options page are header, footer, top, bottom and left margins, line spacing, page length, justification, pages and the starting page number. Embedded within the

It's necessary to follow some conventions when creating Z88 documents

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text it recognises highlight codes, centring, and page breaks — conditional and unconditional.

Pipedream stores each line with a Return at the end. Wordwise and Mini Office II only have Returns at the ends of paragraphs or where you specifically want them, say in an address. This means that there is no way to translate exactly from one format to the other and always get the intended result.

So Convert makes two assumptions. The first,

as already mentioned, is that there is a blank line between paragraphs and the second is that any line with more than 18 blank characters at the end is a line in itself. Convert inserts a Return at that point so this should cope, for example, with addresses. If you find that 18 is not the best value for your needs, just change the figure in line 1200.

So there it is. Now you can create documents — including the commands — on your portable micro and edit them later using your favourite BBC Micro word processor.

Listing 1: Pipedream to Wordwise converter

```

10 REM Pipedream to Wordwise file con
verter
20 REM by John Allen
30 REM (C) The Micro User
40 :
50 DIM high$(8,3),high%(8),translate$(
8,2),headfoot$(4),headfoot%(4)
60 FOR I% = 1 TO 8:FOR J% = 1 TO 3
70 READ high$(I%,J%)
80 NEXT
90 high%(I%) = 0
100 NEXT
110 FOR I% = 1 TO 8:FOR J% = 1 TO 2
120 READ translate$(I%,J%)
130 NEXT:NEXT
140 FOR I% = 1 TO 4
150 READ headfoot$(I%),headfoot%(I%)
160 NEXT
170 MODE 7
180 banner$ = CHR$(132) + CHR$(157) +
CHR$(141) + CHR$(131) + "Pipedream to Wo
rdwise Conversion"
190 PRINT TAB(0,2) banner$
200 PRINT TAB(0,3) banner$
210 PRINT TAB(0,7) CHR$(131);"1) Impor
t file from 288"
220 PRINT TAB(0,8) CHR$(131);"2) Conve
rt file on BBC disc"
230 PRINT TAB(0,11) "Please enter choi
ce:";CHR$(134);
240 REPEAT:choice$ = GET$:UNTIL INSTR(
"12",choice$) <> 0
250 PRINT choice$
260 IF choice$ = "2" THEN PRINT TAB(0,
15) "BBC filename:";CHR$(134);:INPUT ""
pfile$:GOTO 460
270 *FX7,7
280 *FX2,1
290 PRINT TAB(0,14) "Send file using Z
88 Import/Export"
300 PRINT TAB(3,16) CHR$(131);"Transmi
t baud rate 9600"
310 PRINT TAB(3,17) CHR$(131);"
Parity None"
320 PRINT TAB(3,18) CHR$(131);"
Xon/Xoff No"
330 REPEAT:B% = GET:UNTIL B% = 27
340 B% = GET:IF B% <> 70 THEN GOTO 330
350 PRINT TAB(0,20) "Receiving file ..
.."
360 pfile$ = "!!TEMP!"
370 H% = OPENOUT pfile$
380 B% = GET
390 REPEAT
400 BPUT#H%,B%
410 B% = GET
420 UNTIL B% = 27
430 B% = GET:IF B% <> 90 AND B% <> 69
THEN BPUT#H%,27:GOTO 390
440 *FX2,0
450 CLOSE#H%
460 X% = OPENIN pfile$
470 IF X% = 0 THEN PRINT "CHR$(130);pf
ile$;" does not exist""Press any key":b
$ = GET$:GOTO 170
480 PRINT "Wordwise filename:";CHR$(1
34);:INPUT "" wfile$
490 Y% = OPENOUT wfile$
500 PROCOptions
510 PROCText
520 PROCsendtext("BP")
530 CLOSE#0
540 IF choice$ = "1" THEN *DELETE !!TE
MP!
550 END
560 :
570 REM decode options
580 DEFPROCOptions
590 PROCsendtext("EP")
600 PROCsendtext("DF"):BPUT#Y%,13
610 :pl% = 66:foot% = 0:head% = 0
620 REPEAT:B% = BGET#X%:UNTIL B% = ASC
"%"
630 B% = BGET#X%:IF B% <> ASC"0" THEN
GOTO 860
640 IF BGET#X% <> ASC"P" OR BGET#X% <>
ASC"%" THEN GOTO 620
650 code$ = CHR$(BGET#X%) + CHR$(BGET#
X%)
660 FOR I% = 1 TO 8
670 IF code$ <> translate$(I%,1) THEN
NEXT ELSE GOTO 690
680 GOTO 790
690 PROCsendtext(translate$(I%,2))
700 pl$ = ""
710 IF code$ = "JU" THEN B% = BGET#X%
720 B% = BGET#X%
730 IF code$ = "PL" AND B% <> 13 THEN
pl$ = pl$ + CHR$(B%)
740 IF B% <> 13 THEN BPUT#Y%,B%:GOTO 7
20
750 IF code$ = "HE" THEN head% = 1
760 IF code$ = "FO" THEN foot% = 1
770 IF code$ = "PL" THEN pl% = VAL(pl$
)
780 I% = 8:NEXT:GOTO 620
790 FOR I% = 1 TO 4
800 IF code$ <> headfoot$(I%) THEN NEX
T ELSE GOTO 820
810 GOTO 620
820 size$ = CHR$(BGET#X%)
830 B% = BGET#X%
840 IF B% <> 13 THEN size$ = size$ + C
HR$(B%):GOTO 830
850 headfoot%(I%) = VAL(size$):GOTO 62
0
860 BS% = headfoot%(1) + headfoot%(2)
+ foot%
870 TS% = headfoot%(3) + headfoot%(4)
+ head%
880 PROCsendtext("BS"):PROCNumber(BS%)
890 PROCsendtext("TS"):PROCNumber(TS%)
900 IF head% = 1 THEN PROCsendtext("HP
"):PROCNumber(headfoot%(4)+1)
910 fp% = headfoot%(2) + 1
920 PROCsendtext("FP"):PROCNumber(fp%)
930 PTR#X% = PTR#X% + 4
940 REPEAT:B% = BGET#X%:UNTIL B% = ASC
"%"
950 ww$ = ""
960 B% = BGET#X%
970 IF B% <> ASC"%" THEN ww$ = ww$ + C
HR$(B%):GOTO 960
980 PROCsendtext("LL"):PROCNumber(VAL(
ww$)-1)
990 BPUT#Y%,13
1000 ENDPROC
1010 :
1020 REM send a number
1030 DEFPROCNumber(n%)
1040 IF n% < 10 THEN BPUT#Y%,n%+48:END
PROC
1050 IF n% < 100 THEN BPUT#Y%,(n% DIV 1
0)+48:BPUT#Y%,(n% MOD 10)+48:ENDPROC
1060 BPUT#Y%,(n% DIV 100)+48:BPUT#Y%,(n
% DIV 10)-10*(n% DIV 100)+48:BPUT#Y%,(n
% MOD 10)+48
1070 ENDPROC
1080 :
1090 REM translate text
1100 DEFPROCtext
1110 endcol% = 0:cr% = 0
1120 REPEAT
1130 char% = 0
1140 REPEAT
1150 IF endcol% = 1 THEN GOTO 1210
1160 B% = BGET#X%
1170 IF B% = ASC"%" THEN PROCdecode:GOT
0 1150
1180 IF B% <> 13 THEN BPUT#Y%,B%:char%
= char% + 1:GOTO 1210
1190 IF char% = 0 AND cr% = 0 THEN BPUT
#Y%,13:BPUT#Y%,13:cr% = 1:GOTO 1210
1200 IF VAL(ww$)-char% > 18 THEN BPUT#Y
%,13:cr% = 1 ELSE cr% = 0
1210 UNTIL B% = 13
1220 FOR I% = 1 TO 8
1230 IF high%(I%) = 1 AND high$(I%,3) =

```

This listing is included in this month's tape & disc offer. See order form on Page 151.

Turn to Page 71 ▶

It's the latest - and the most exciting add-on for the BBC Micro



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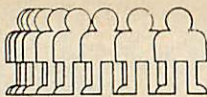
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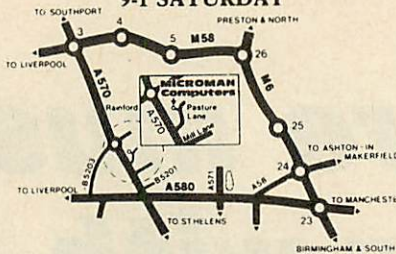
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Now for the first time you can add the Master Co-processor boards, to your standard BBC model B, or B Plus. With this brand new launch from Watford Electronics you can attach any BBC Master co-processor to the original BBC Micro. Once again Watford strides ahead with a new concept in BBC B Micro add-ons. This unique external Co-Pro Adaptor, is protected by patent applications.

Use the super fast Turbo Board with your BBC B, it is much faster than the 6502 2nd processor superseding it.

With the 512K add-on your standard BBC machine achieves IBM PC compatibility at a realistic price running GEM, Lotus 123 and many other programs. Included with the 512k package is a high precision mouse and the Digital Research GEM suite of software; GEM Desktop, GEM Write GEM Paint. This requires both the 1770 DFS and the ADFS to be fitted to your computer.

To use other co-processors you require a BBC B with DNFS 1.20 or higher, or BBC B+ fitted with 1770 DFS 2.20 or greater. Co-processors work exactly like a second processor.

Master owners may use Co-Pro to add a second Co-processor externally. Watford, brings power to your BBC at only:

£35 (carr £5)

SPECIAL OFFER

EPROMs for BBC's Sideways ROMs.

2764-250nS £3.00

27128-250nS (12V5) £3.25

27128-250nS (21V) £4.50

RAMs (Low power) for ATPL, WATFORD, etc., Sideways ROM Boards

6264LP (8K) £4.50

2 x 6264LP (16K) £8.95

NEW

BBC PCB DESIGNER

At last! A PCB design package for the BBC Micro that eclipses some industry CAD software. Hard to believe, isn't it? Just look at some of the impressive package specification:

- Library Component Designer
- Component Library (over 200 parts)
- Component List Editor
- NetList Editor
- PCB Board Designer
- Plotter Driver
- Dot Matrix Printer Driver

This integrated suite of programs is packed full of sophisticated PCB related features making the design of a circuit board a dream instead of a nightmare.

Input for the design may be manual, taking components from the library and connecting them, or highly automatic starting from a netlist and list of components. In auto mode, PCB Designer will never allow you to forget a connection again! And of course, either in manual or auto mode, connectivity is maintained no matter how you later move the parts around and route the tracks. Connections snap together and angles are corrected. Through hole vias and track thickness are established automatically and many more features, far too numerous to mention here, are included in the system.

Some of the PCB Designer's features are:

- Over 120 library pad sizes/shapes
- Four colour adjustable palette
- Zoom range 2:1 to 1:4
- Highlighting of specific tracks
- Normal and surface mounted components
- Rapid screen review
- Menu driven
- Variable gridlock
- Switchable measurement grid
- Pre-select pan/scroll facility
- Large 24" x 24" Board size
- Copy route facility
- Connectivity held at all times
- Ratsnesting of part connections
- Auto-placement of text references
- Text linked to parts
- Automatic placement of vias
- Printer and plotter outputs provided
- Comprehensive manual

TYPES OF PLOT OUTPUT

Top and bottom track artworks, top and bottom silkscreens, solder resist mask, drilling detail drawing and check plot. All these may be with pad holes on/off, scale of 2:1 or 1:1, board edge on/off, 90 degrees rotation, mirror image, width of pen, x & y offsets and batch plots to disc.

The above is only a taste of the superb features of this software, surely capturing previously unknown performance from the BBC Master computer. BBC B owners will need to fit at least one block of sideways RAM, Shadow screen memory and a disc drive. A trackerball or a mouse is also required.

BBC PCB Designer is supplied on a 32K PAL PROM and comes complete with two discs and a comprehensive manual containing examples and useful information on PCB design.

By the way, as a bonus, PCB Designer is also suitable for many other schematic drawing applications such as circuit diagram drawing.

Introductory Offer: £99

(Please write in for further technical details)

Archimedes Real-Time Digitiser

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner.

Once captured, Video images can be stretched, squashed, rotated, stored on disk, printed, or used by applications software.

Applications include desktop publishing, graphics, animation, image analysis and recognition, medical imaging, automatic inspection and measurement, databases, interactive video, remote transmission of pictures via a modem, movement detection ... or anything else you can think of!

SPECIFICATION

SOFTWARE

All the driver software for the digitiser is contained in a ROM on the podule. Facilities provided include:

- Grabbing of images to the screen or dumping to memory.
- Continuous grabbing and display for previewing or camera alignment.
- "Hot key" grabbing - pressing a (configurable) key combination grabs and displays an image on the screen while another program (e.g. paint software such as Artisan) is running.
- Scaling (zoom/shrink) any section of an image to any size in X and Y directions, with optional XY flip, window clip and logical (AND/OR/XOR) plotting.
- Rotation and scaling to any angle and size, rotating about any point, with optional window clip, and logical (AND/OR/XOR) plotting.
- Very versatile matrix printer screendump facility for Epson FX, LQ and EX compatible printers - pictures can be printed to ANY size (including multiple sheets) at any orientation, using any available printer density and one of six internal sets of dot patterns, or with user definable patterns (pattern editor supplied). The screen-dump can also be used for general purpose graphics screen printing.
- Pixel value lookup tables: pixel values can be passed through a user defined lookup table to allow contrast enhancement, thresholding pseudo-colouring etc.
- Smoothing and noise spot removal to enhance image quality.
- Creation of sprites from all or part of a digitised image.
- Saving and loading of digitised images in compressed format.
- Combination of pictures by adding, averaging, subtracting, multiplication etc.
- Much faster versions of the Arthur *ScreenLoad and *ScreenSave commands.

UTILITY DISK

A disk is included, containing sample pictures, examples and utility programs including the following:

- Colour image grabbing using colour filters with monochrome or colour cameras, including colour balance adjustment and scaling facilities.
- Pattern editor for 2 colour display modes and printer screendumps.
- 512 line interlaced display for non MultiSync monitors.
- Thresholding to create two colour images.
- Capture and replay of animated sequences.
- Several example programs illustrating the use of digitiser software.

RESOLUTION

Images are digitised to 512 (h) x 256 (v) pixels, and then scaled to fit the Archimedes' screen. It is possible to digitise to 512 x 512 pixels if the picture is stationary for about 0.1 second. 512 x 512 images can either be displayed on a MultiSync monitor, or on a normal monitor using interlacing.

Pictures are digitised to 64 levels of grey (6 bits). Note, however, that it is only possible to display all 64 levels on a monochrome monitor, or a colour monitor which has a composite (CVBS) input. For this reason, the Philips CM8533 monitor is recommended instead of the standard Archimedes monitor. It is also possible to connect both a colour and a monochrome monitor at the same time.

Any 2,16 or 256 colour graphics mode can be used to display digitised pictures. In two colour modes, grey levels are represented using dot patterns, which may be redefined if required (a pattern editor is supplied).

SPEED

Video fields are captured in real time (1/50th sec.), and then transferred to Archimedes' memory or the screen. The grab/display rate is dependant on the screen mode and picture size, up to 25 fields per second for quarter screen images, or 12.5 per second for fullscreen (Mode 9).

HARDWARE

The digitiser is a single width podule, with a BNC socket on the rear panel for the video input, which may optionally be terminated via a link. There is 128K of on-board memory to store the digitised image, and a 32K ROM on the podule contains all the driver software.

Automatic video level control and black level clamping circuitry is used to ensure that the optimum contrast is obtained from a variety of video sources. A filter is included to avoid patterning effects when using colour sources.

Price £249

Continued →

£10 Prize letter

I AM delighted to see that you have started a Z88 column, as I have recently bought one to use with my BBC B. As a dedicated Wordwise-Plus user I am finding the conversion problems to and from Pipe-dream quite difficult. Do you have any suggestions?

I use Wordwise-Plus to write reports, and I find that one of the facilities lacking is the ability to auto-number section

Z88 conversion problems

headings and subheadings, so I have written a segment program to do just that.

It searches the text for .HLn — where n is 0 to 9 — and replaces the string with the appropriate header number. So if the current header is 2.1.3, .HL1 is replaced with 2.2. Each occurrence of .HLn increments the header number at level n, zeroing all higher levels. A contents page

is built up in segment 9.

The program should be placed into any segment from 0 to 8 and invoked — using Shift+fn where n is the segment number containing the program — after saving the text, but just prior to printing.

The program can be adapted for multi-file documents if segment 9 is not cleared at the start and it should be called immediately

prior to printing each file.

The current parameters are saved and restored, so special page numbers and so on can be set up before calling the program.

— **John Crouchley, Wollaton, Nottingham**

● The listing on Page 67 will convert your Pipedream file into a format suitable for Wordwise-Plus or Mini Office II word processors.

```

REM WORDWISE-PLUS segment
program
REM Replace all .HLn in ma
in text with heading numbe
rs
REM Written John Crouchley
REM Place in any segment e
xcept 9.
REM Uses SEG9,A%,A$,B$
REM returns Contents in se
gment 9
REM Initialise heading num
ber
REM delete following three
lines if multi-file use
REM is required
B$="0"
SELECT SEGMENT 9
DELETE TEXT

REM Now find all ".HL"s
SELECT TEXT
DELETE MARKERS
CURSOR TOP
REM UNTIL EOF
REPEAT
  FIND ".HL"
  IF EOT THEN GOTO NOMORE
  REM DELETE .HL
  DELETE AT 3
  REM GET HL NUMBER
  A%=ASC(GCTS)
  IF A% < ASC("0") OR A% >
ASC ("9") THEN GOTO ERR
  A%=A% - ASC("0")

REM DELETE THE HL NUMBER
DELETE LEFT 1
REM NOW TO GENERATE THE
NEXT HEADER NUMBER
REM SELECT WORKING SPACE
SEGMENT
SELECT SEGMENT 9
CURSOR TOP
REM INSERT THE HEADER NU
MBER STRING
TYPE B$
REM INSERT DEFAULT LOWER
LEVELS
TYPE ".0.0.0.0.0.0.0.0
.0R"
CURSOR TOP

REM MUST NOW FIND A%TH.
DOT
.FINDDOT
IF A%=0 THEN GOTO FOUNDD
OT
FIND "."
IF EOT THEN GOTO ERR
CURSOR RIGHT
A%=A%-1
GOTO FINDDOT
.FOUNDDOT
REM INSERT MARKER
FKEY 3
REM NOW READ THE CURRENT
LEVEL NUMBER
B$="0"
REPEAT
  A%=(A%*1fL)+ASC(B$)-ASC
("0")
  B$=GCTS
  UNTIL B$<"0" OR B$>"9"
  IF B$<> "." THEN GOTO ERR
  REM NOW DELETE REMAINDER
  OF DEFAULTS
  CURSOR AT 39
  FKEY 3
  DELETE MARKED
  REM NOW INCREMENT SELECT
ED NUMBER
  A%=A%+1
  REM BUILD LEVEL NUMBER S
TRING
  TYPE STR$(A%)
  CURSOR TOP
  FKEY 3
  B$=GLTS
  REM DELETE THE WORK SPAC
E USED
  FKEY 3
  DELETE MARKED
  REM BACK TO THE TEXT
  SELECT TEXT
  REM INSERT THE HEADER NU
MBER
  TYPE B$

  REM NOW GET THE PAGE NUM
BER
  FKEY 3
  FKEY 3
  SAVE PARAMS "TEMP"
  PREVIEW MARKED
  A%=P%

DELETE MARKERS
LOAD PARAMS "TEMP"
*DELETE TEMP

REM SAVE THE LINE FOR CO
NTENTS PAGE
CURSOR AT 0
A$=GLTS
REM INSERT LINE IN CONTE
NTS PAGE
SELECT SEGMENT 9
CURSOR BOTTOM
TYPE AS
REM INSERT PAGE NUMBER
TYPE "GFIW"
TYPE STR$(A%)
TYPE "R"
REM BACK TO THE TEXT
SELECT TEXT
REM UNTIL NO MORE HL STR
INGS EXIST
.NOMORE
UNTIL EOT
SELECT SEGMENT 9
DISPLAY
END

REM Error Handling
.ERR
SELECT TEXT
DISPLAY
END

REM End of segment program
    
```

Keywords disappeared

I HAVE a BBC Micro with Basic 1. I have typed in the Mini-Com Graphics Compiler in the March Edition of The Micro User and used Get it Right! to remove all my typing mistakes and I am satisfied that my version matches the one in the magazine. But the checksum reports errors in lines 400, 620 and 740. I have checked each of these lines and can find no errors.

I hope you can enlighten me as I am very interested in

computer graphics and have no other graphics system. — **A. Stoner, Milton Keynes, Buckinghamshire.**

● Unfortunately the program was written for Basic 2 but listed on a Basic 1 micro. The difference in the tokens caused some keywords to be missed and the correct lines are:

```

400 IF LEFT$(LS,1)="" OSC
LI LS:ENDPROC
620 PROCNEW:CH%=OPENIN(FS)
:IF CH%=0 PRIN
T"No such file.":ENDPROC
740 OSCLI"SAVE"+FS+" "+ST
R$"base%+" STR$ "0%+" STR
$ "EX%+" STR$ "EX%:ENDPROC
    
```

Z88 transfer

I HAVE been trying various things on the Z88 and found that in the program transfer, after execute, if I try to save the program using the same filename nothing happens.

Another oddity is that if I have a line in the BBC Micro like this:

```
CP%+0:B%=0
```

it transfers as:

```
C%PC%=0:B%PC%=0
```

What's happening? — **D.H. Griffin, Northampton.**

● For the life of us we can't

tell. Unless any of our readers know differently, we're sticking with our belief that you've made a slip in entering your transfer program.

Master tip

WHEN you are constantly changing discs there can be problems in storing them so they are in easy reach.

However, on the Master series the problem has been unknowingly solved by Acorn. When two rom cartridges are fitted to the computer a disc or two will fit nicely between them. — **Ben Summers, Norwich.**