

# THE MICRO USER

Volume 5  
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January 1988  
£1.25

All about  
the BBC Micro  
and Archimedes

## PARTNERS

Linking Sinclair's  
Z88 to your BBC

## EDUCATION

Play to learn with  
Number Invaders

## ARCHIMEDES

Queries answered  
Artisan reviewed

## GAMES

Arcade action +  
Classic strategy

## UTILITIES

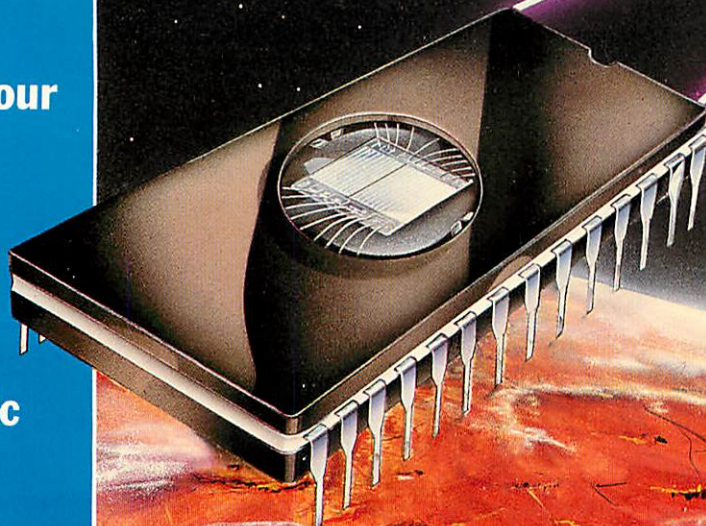
How to create your  
own art gallery  
Using tape to  
archive files

## REVIEWS

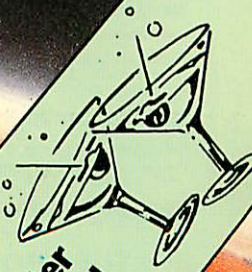
★ Advanced Basic  
★ Midi hardware  
★ Wave analysis  
... plus all the  
latest games

# RAM WARS

Turn your BBC Micro's memory  
into a programming battlefield



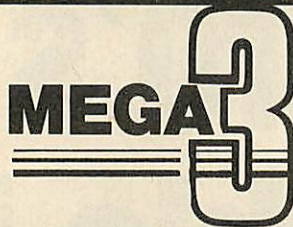
Festive fun  
with our  
computer  
cocktail  
maker



# Software for the BBC Micro

## MEGA-ROM

A single 128K chip containing INTER-WORD, INTER-SHEET and INTER-CHART. The package contains all manuals, keystrips and quick reference cards supplied with the individual packages, but the software is *all* on a single chip, occupying just one ROM socket.



MEGA-ROM is compatible with the entire range of BBC Micros, Model-B, B+, B+128, Master and Master Compact. A version will shortly be available for the new Archimedes.

Price: full package £85.00+VAT (£97.75 incl.)

128K  
ROM

## INTER-WORD

A full-feature 'What You See Is What You Get' word processor. This is menu driven, simple to use and offers a whole host of advanced features including:

- On-screen highlights—bold, underline and dotted underline
- Ruler-controlled margins and tabulation
- Page breaks, headers and footers shown on-screen
- Information can be transferred directly to or from INTER-SHEET
- 40, 53, 80 and a unique 106 column screen mode
- Ability to handle documents longer than BBC memory
- Fully integrated with SPELL-MASTER via a special menu
- Multi-column printing

## INTER-SERIES

## INTER-CHART

A comprehensive chart and graph plotting package. Data can be entered directly at the keyboard, transferred from INTER-SHEET, INTER-WORD or INTER-BASE, or read from file. This data may then be displayed in a variety of graphical forms, edited, printed, saved, etc.

Features include:

- Up to 16 graphs in each INTER-CHART package
- Bar and Line graphs can be overlaid on each other
- Pie chart plotting: One segment can be highlighted by pulling it out from the rest of the pie chart
- Bar graph plotting: Individual bars can be different colours
- Line graph plotting: Points can be marked by a cross or unmarked; joined by a line or marked individually; shown in any colour
- Adjustable scales allow you to show all or only part of a graph
- Graphs can be displayed with logarithmic scales
- Labelling: text may be placed at any position on the graph, allowing very flexible labelling.
- Printing: an in-built screen dump is provided for Epson and compatible printers. Access to other screen dump programs is also supported (and documented). Compatible with the Plotmate Plotter.

## INTER-SHEET

The fastest spreadsheet available for the BBC Micro, suitable for home or business use—anything from calculating the home budget to financial forecasting.

INTER-SHEET is driven by prompts and provides a full 'help' list. Some of its main features include:

- Column widths individually adjustable
- Text or formula/number in any box
- Full range of mathematical formulae
- 48, 80 and unique 105 column screen modes supported
- Information can be transferred directly to INTER-CHART for display as a graph, or to INTER-WORD for inclusion within documents. Data can also be read from INTER-WORD, or from a file
- Fast re-calculation and replication of boxes
- Any row, column or box can be locked to prevent accidental erasure

## SPELL-MASTER

A totally ROM-based spelling checker for use in conjunction with INTER-WORD. This allows checking of the entire text, just a marked section of the text, an individual word, instant checking as-you-type, browsing through the dictionary, etc.

A single 128K ROM, occupying just one ROM socket. This contains a standard vocabulary of almost 60,000 words (extendable in sideways RAM) and can check at an astounding speed of 10,000 words per minute.

Price: £51.30+VAT (£59.00 incl.)

128K

## INTER-BASE

A database programming language with simple 'card index' interface. This will interface directly to all packages in the MEGA ROM. It allows data/results produced by INTER-SHEET to be used, output can be sent to INTER-CHART, and complex mail-merging with INTER-WORD documents can be achieved.

This is a 64K ROM, occupying just one socket. Compatible with the entire BBC Micro range (not compatible with the Archimedes).

Price: £60.00 + VAT (£69.00 incl.)

64K



Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead  
Herts HP2 6EX. Tel C442 63933

Access & Visa welcome  
Orders despatched within 24 hours



# Computing on the move

CLIVE Sinclair's new Z88 portable micro has much more to offer the BBC Micro user than a very reasonable implementation of BBC Basic.

You'd look pretty silly on the train with a BBC Micro on your lap. But the Z88 lets you word process documents, create spreadsheets or write Basic programs anywhere you wish and then transfer them to your trusty BBC Micro when you get home.

For £24.95 Cambridge Computers will sell you a cable and software to transfer files between the two machines. But, as

## Dave Watts shows how to transfer files from a Z88 to a BBC Micro

this article shows, it can be done for much less.

First of all, however, you will need a cable with a series D 9-pin plug at one end to connect to the Z88 and a 5-pin DIN C domino plug at the other to go in the RS423 socket on the BBC Micro.

Figure 1 shows the wiring. Both con-

nections are from the point of view of looking at the sockets on the machines.

The software you need is a standard terminal program, adapted from a listing in the Advanced User Guide but with a few handy additions.

The default serial rates for the BBC Micro and the Z88 are both 9600 baud, so there are no problems in that respect. The Z88 sends files as follows:

```
ESC"N"
  Filename
ESC"F"
  File
ESC"E"
```

Our listing – IMPORT – asks for a filename, opens it on the BBC drive, then starts SPOOLing the file from the Z88 after ESC"F" has been detected. When ESC"E" is received the file is closed automatically.

Once you have entered the listing and made the lead, transferring files just involves the following simple steps:

- Type your text on the Z88. It makes sense to use the same line length that you use on your BBC Micro word processor.
- Save the text to the Z88's ram, ensuring that the Save Plain Text option is set to Yes. This means that no control codes will be in the saved file.
- Run the program IMPORT on your BBC micro.
- When you are prompted, send the file from the Z88, using the Import/Export facility.
- You are then offered the option of going straight into a word processor. If you press Y you will be presented with the options shown in Figure II.
- Just select the appropriate one and you'll be taken to the Edit mode with the file ready loaded.

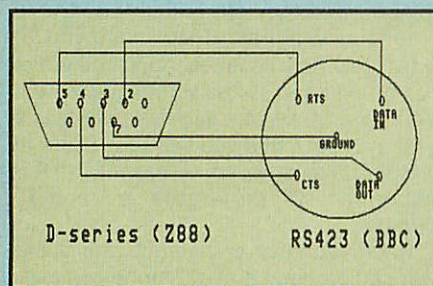


Figure 1: The wiring diagram for BBC Micro to Z88 file transfers

- ```
1 .. MINI OFFICE II
2 .. WORDWISE PLUS
3 .. WORDWISE
4 .. VIEW
5 .. INTERWORD
```

Figure II: Word processor options available

## Z88 specifications at a glance

- Processor:** CMOS Z80 (3MHz)
- Rom:** 128k (includes dos, applications software and BBC Basic)
- Ram:** Battery backed and expandable by 32k, 128k, and 1Mb cartridges to 3Mb
- Screen:** Epson super-twist LCD, 8 x 80 characters, 64 x 640 pixels
- Keyboard:** Qwerty 64-key membrane
- Power:** 4 alkaline cells or optional mains adapter (£9.95)
- Size:** 293mm(11.5in) x 209mm(8.25in) x 23mm(.87in)
- Weight:** .85kg(1.87lb)
- Interfaces:** RS-232 serial port, Z80 expansion bus plus slots for three expansion cartridges
- Software:** Word processor, spreadsheet, database, diary, calendar, clock and alarm
- Price:** £249.95

# FEATURE

B

B+

M

## The Z88 itself

Is it worth shelling out £249.49 to get a Z88? If you're often away from your BBC Micro I'd say yes.

You can have instant access to a few spreadsheets in a meeting, type the minutes as the meeting progresses, then at home or in the office transfer the file to a BBC Micro for further processing and print-out. You can also knock up Basic procedures on the train, then transfer them at home.

Another point of interest to the BBC Micro owner is that Pipedream has the same file structure as View Professional and the files are compatible.

It has to be said, though, that the Z88 doesn't sport the sturdiest physical construction ever and I don't think it would last long in the average classroom or on a building site. But it's an elegant machine, reasonably priced, and with 128k of excellent software on rom.

## Irreverent note

The first Z88s came with a temporary operating system containing a few bugettes. Cambridge Computers wrote to customers offering to upgrade their machines - free of charge.

I remember in the early days of the BBC Micro having to pay extra for an operating system that actually worked.

Not only that, but those nice people at Cambridge Computers sent an eprom cartridge, also free, to save any important data on before the machine was sent away for upgrading. A few Brownie points to Sir Clive.

Get it right!

|              |              |              |
|--------------|--------------|--------------|
| 10 = 00      | 180 = FE27 E | 350 = 7706 F |
| 20 = 00      | 190 = 3F49 1 | 360 = 8833 F |
| 30 = 00      | 200 = 256 3  | 370 = 1FC9 6 |
| 40 = 9EE3 3  | 210 = 88E7 B | 380 = 474C 3 |
| 50 = 6140 9  | 220 = 482B C | 390 = CF4C 5 |
| 60 = DA15 D  | 230 = 4C8A 1 | 400 = F54 0  |
| 70 = CA78 F  | 240 = 6140 3 | 410 = C91D 0 |
| 80 = 46F C   | 250 = 50CD D | 420 = A5DE 8 |
| 90 = 7966 4  | 260 = 98F7 8 | 430 = D1B6 0 |
| 100 = 9CE9 5 | 270 = CFA0 F | 440 = E80C 8 |
| 110 = EC4D 0 | 280 = 85EF C | 450 = 8AFC F |
| 120 = 6CE3 E | 290 = 100B 4 | 460 = CEAD 4 |
| 130 = BFBA 4 | 300 = 7D42 3 | 470 = 3712 A |
| 140 = DD48 1 | 310 = 54CB C | 480 = 2C83 8 |
| 150 = 2404 7 | 320 = 2E37 B | 490 = FD2E 7 |
| 160 = 5123 0 | 330 = 6D2E E |              |
| 170 = 8BC8 1 | 340 = D6FA 9 |              |

|          |        |          |         |        |          |           |
|----------|--------|----------|---------|--------|----------|-----------|
| AUTO     | DELETE | LIST     | LISTO   | LOAD   | NEW      | OLD       |
| RENUMBER | TRACE  | BPUT#    | CALL    | CHAIN  | CLEAR    | CLOSE#    |
| CLS      | DATA   | DEF      | DIM     | ELSE   | END      | ENDPROC   |
| FN       | FOR    | GOSUB    | GOTO    | IF     | INPUT    | INPUTLINE |
| INPUT#   | LET    | LOCAL    | NEXT    | ON     | ON ERROR | OPT       |
| OSCLI    | PRINT  | PRINT#   | PROC    | PUT    | READ     | REM       |
| REPEAT   | REPORT | RESTORE  | RETURN  | RUN    | SAVE     | SPC       |
| STEP     | STOP   | TAB      | THEN    | TO     | UNTIL    | VDU       |
| ABS      | ACS    | ASC      | ASN     | ATN    | BGET#    | CHR\$     |
| COS      | COUNT  | DEG      | EOF#    | ERL    | ERR      | EVAL      |
| EXP      | EXT#   | FALSE    | GET     | GET\$  | HIMEM    | INKEY     |
| LN       | LOG    | SGN      | SIN     | MOD    |          |           |
| PAGE     | PI     | TIMES    | TOP     | AND    |          |           |
| INKEY\$  | INSTR  | INT      | LEFT\$  | LEN    |          |           |
| LOMEM    | MID\$  | OPENIN   | OPENOUT | OPENUP |          |           |
| POS      | PTR#   | RAD      | RIGHT\$ | RND    |          |           |
| SQR      | STR\$  | STRING\$ | TAN     | TIME   |          |           |
| TRUE     | USR    | VAL      | VPOS    | DIV    |          |           |
| EOR      | NOT    | OR       | WIDTH   |        |          |           |

Not supported:  
 CLG COLOUR  
 ENVELOPE SOUND  
 DRAW GCOL  
 ADVAL MODE  
 MOVE PLOT  
 \*COMMANDS POINT

Figure III: The Z88 Basic commands

## BBC Basic on the Z88

BBC Basic is accessed from the Z88 menu, and most of the commands you know and love are supported. Enter:

PRINT HIMEM-PAGE

and you get:

7424

Type:

AUTO

and the line numbers appear for you to start programming - seems familiar?

A serious omission is the lack of any line editing facilities, so most users will probably write programs in the Pipedream word processor rather than in the Basic environment, for transfer later to a BBC Micro. The Z88 manual explains a

fix that will enable you to do this.

The 100-column, 8-line LCD screen won't run graphics, of course, and if you issue a graphics command you see a polite:

Sorry, not implemented

This doesn't stop you writing programs with graphics commands - you just can't test them until you've transferred the file to your BBC Micro.

For simple number-crunching and statistical applications, however, a BBC Basic program running on the Z88 would be fine. The commands PRINT#, INPUT# and so on are supported so data storage (to the Z88's ram) is possible. A list of which commands are recognised and which are not is shown in Figure III.

```

10 REM IMPORT
20 REM By Dave Watts
30 REM (c) The Micro User
40 CLOSE#0
50 *FX2,2
60 *FX7,7
70 MODE3
80 INPUT"Filename to save on BBC disc ";:INPUT file$
90 osbyte=&FFF4
100 lastchar%=0:newchar%=0:textstart%=FALSE:eof%=FALSE
110 PRINT"Now send file from Z88.... "
120 OSCLI("SPOOL "+file$)
130 REPEAT
140 AX=138:X%=2
150 IF ADVAL(-1)>0 AND ADVAL(-3)>0 THEN Y%=GET:CALL osbyte
160 *FX2,1
170 IFADVAL(-2)>0 THEN newchar%=GET
180 IF lastchar%=27 AND newchar%=70 THEN xtstart%=TRUE:GOTO230
190 IF NOT textstart% GOTO230
200 IF lastchar%=27 AND newchar%=69 THEN eof%=TRUE:GOTO230
210 IF newchar%=27 GOTO 230
220 IFADVAL(-2)>0 THEN VDU newchar%
230 lastchar%=newchar%
240 *FX2,2
250 UNTIL eof%
260 *SPOOL
270 MODE7:PRINT

280 FORI%=1TO2:PRINT CHR$141CHR$129"The Micro User Z88/BBC Micro transfer":NEXT I
290 PRINT" File saved on disc as";CHR$130;file$;CHR$135;";"
300 PRINT"CHR$134"Load into word processor (Y/N)?";
310 REPEAT:GS=GET$:UNTILGS="Y"ORGS="N"
320 PRINT"GS:IFGS="N" END
330 PRINTCHR$133"1 .. MINI OFFICE II"
340 PRINTCHR$133"2 .. WORDWISE PLUS"
350 PRINTCHR$133"3 .. WORDWISE"
360 PRINTCHR$133"4 .. VIEW"
370 PRINTCHR$133"5 .. INTERWORD"
380 PRINT"CHR$131"Press a number";
390 ONGET-48GOTO400,410,420,430,440
400 command$="*W"+CHR$13+CHR$143+CHR$143+CHR$13+file$+CHR$13+CHR$27:GOTO450
410 command$="*W."+CHR$13+":N."+CHR$13+"2"+file$+CHR$13+CHR$27:GOTO450
420 command$="*W."+CHR$13+"N"+CHR$13+"2"+file$+CHR$13+CHR$27:GOTO450
430 command$="*WORD"+CHR$13+"L"+file$+CHR$13+CHR$27:GOTO450
440 command$="*IW."+CHR$13+"2"+file$+CHR$13+CHR$27:GOTO450
450 MODE7
460 FORprocess%=1TOLEN(command$)
470 Y%=ASC(MID$(command$,process%,1)):X%=0:A%=138:CALLosbyte
480 NEXT
490 END
    
```