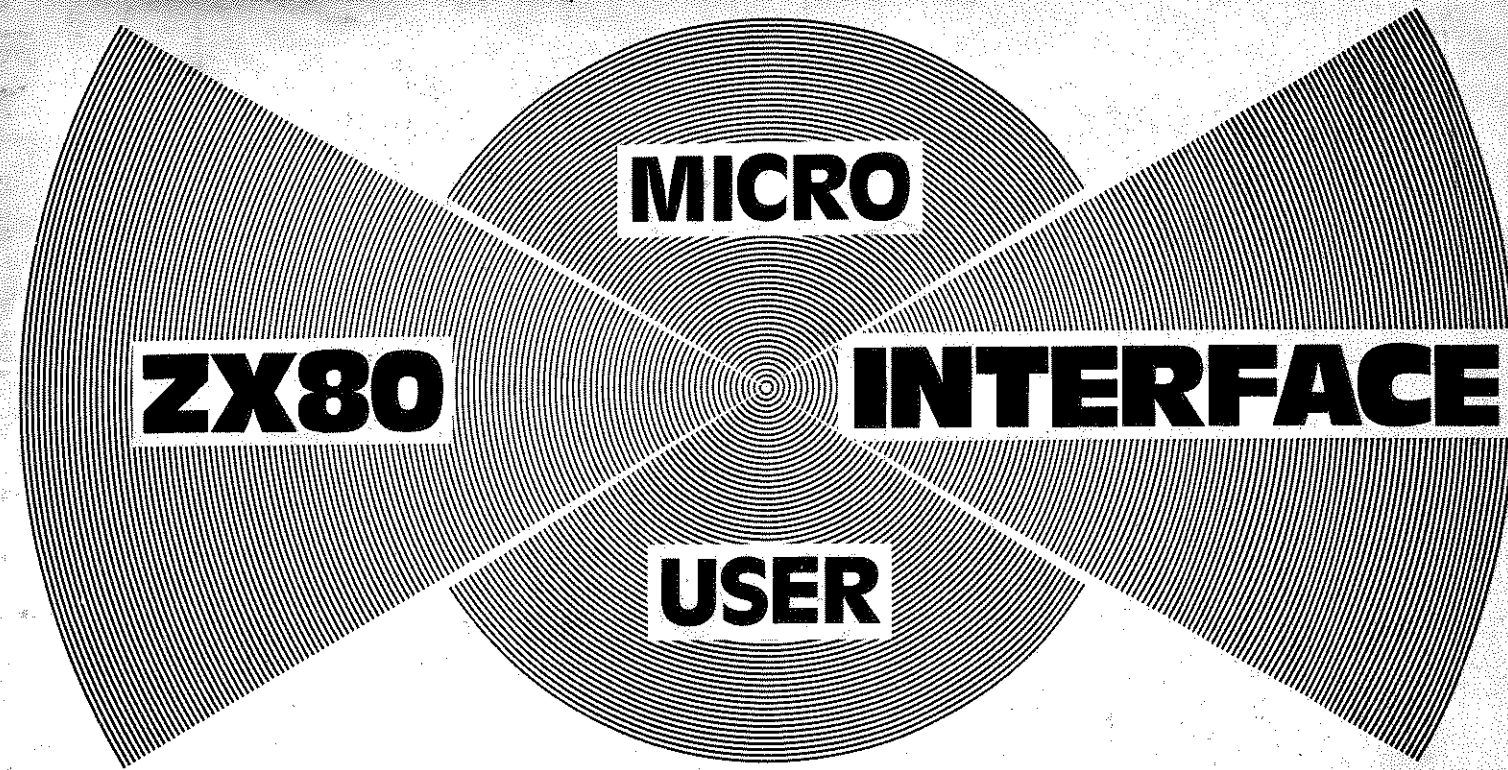
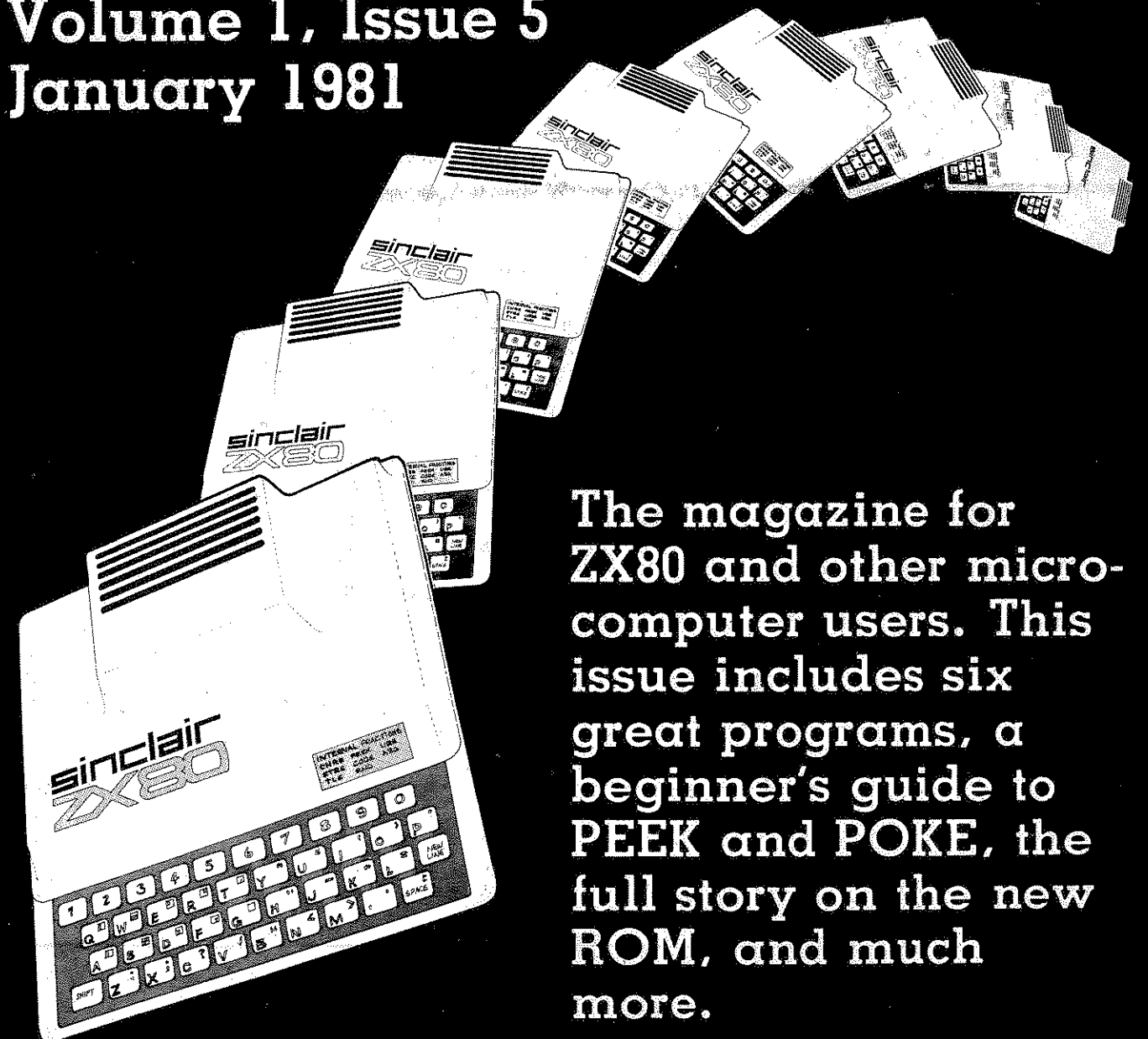




Volume 1, Issue 5
January 1981



The magazine for
ZX80 and other micro-
computer users. This
issue includes six
great programs, a
beginner's guide to
PEEK and POKE, the
full story on the new
ROM, and much
more.

SETTING STANDARDS

IT'S TIME WE SET SOME SOFTWARE STANDARDS

It is in everybody's interests to have a set of standards for people writing and submitting software — to make sure it's easy to read and to minimise the chance of mistakes.

From now on, when you send us programs — and you'll probably find it useful to follow the National ZX80 Users Club software standards for your own work as well — could you please make sure they conform, where possible, to the following guidelines:

- Line numbers to start at 10, and increment by 10 (unless there is a special reason — such as GOSUB 5*A + B)

- Variables to start at A, and follow through as single letters, in alphabetical order (the same for FOR/NEXT loops and arrays), except where using the same letter could cause confusion

- Where possible, subroutines to be at, or near the top of the program (with, perhaps, the first line being GOTO ...)

- The letters "O", "I", "S" and "Z" not be used as variable names, unless unavoidable (to prevent them being confused with 0, 1, 2 and 5)

- Strings to start at A\$ and follow through in alphabetical order

- Subroutines — where possible — to be used in place of a long string of IF/THENs

- Programs to be robust, so they do not require a GOTO command instead of RUN

- Variables to be stored, where possible, in a non-volatile manner (such as POKEing into a REM statement) so CLEAR can ensure the maximum working memory is available at all times. This procedure is not entirely trouble-free, and is less important with 4K or 16K machines, but can be very useful for programs which must be written in less than 750 bytes (most on the 1K machines cause problems if they exceed around 670 bytes, but with CLEAR you can write programs which occupy the low eight-hundreds).

- The symbol _ (an asterisk underlines, with a space either side of it) to be used to show a single space in a PRINT statement, if such space is vital, and would not necessarily be evident from the context. A number of spaces should be shown as 20 PRINT "(3 spaces) YOU WIN", i.e. the number of spaces, and the word space, in lower case letters, within brackets

- Zero to be represented as the "slashed nought", i.e. 0

These are not binding rules for listing, but are suggested as a means of reducing the chance of a listing being misread.

There are times when it is useful to use more than one letter for a variable (either a word like SUM, or SCORE, or a combination of letters and digits starting with the letter) but if this will not help your understanding of a listing, stick to single letters, and assign these in alphabetical order.

The standards can be ignored if there is a valid reason, *except* for the use of _ in a PRINT statement, and 0 for zero.

DOCUMENTATION

Much documentation is a waste of time and paper.

Although computer courses at schools tend to stress the need for documentation, is it — in our opinion — unnecessary in many cases.

The cardinal rule for documentation is: If the algorithm is not transparent, document.

Saying things like "Lines 20 to 50 initialise variables" seems pretty pointless, while it is obviously of value to have supporting notes to a program pointing out things like "Line 370 produces a random number from the seed produced in the previous line, and uses this as a GOTO destination to decide the computer's reaction to the player's move".

It is more important to tell an operator what to do after pressing RUN than it is to tell the operator why the computer does what it does when you do, although most operators will want to know the 'why' in due course.

If you cannot fit the instructions into the main program, either write a shorter, "preface" program, or provide the user with clearly written instructions, and explain what kinds of responses the computer expects from its prompts.

Whenever you have the memory, include lines to exclude unwanted input.

For example, if line 70 says "INPUT YOUR GUESS (1 TO 10)", line 80 will be something like INPUT A, and line 90 should be IF A < 1 OR A > 10 THEN GOTO 70. This will ensure that erroneous data will not contribute to a program crash.

The code of a string can be used to check string input (such as IF CODE(A\$) = 57 THEN... or IF NOT CODE(A\$) = 30 THEN... or the less than sign can be used to stop a program if anything other than a null string is put in by the operator. The line, in this case, could read: IF N\$ > "" THEN STOP.

We'd be very interested in hearing your comments on the above standards outline, so we can refine them and make them more generally useful.

Please try them for the next program you write, and see if they work for you.

If you find them boring, or discover a simpler way to avoid confusion, please write in and let us know.

INPUT

Welcome to the new, upgraded INTERFACE. As you can see, the club's magazine has come of age. We've retained every popular feature from the smaller INTERFACE in this new magazine, and added other sections sure to prove of interest.

From now, INTERFACE will come out once a month. We guarantee there will be at least six ready-to-run, complete games in each edition, plus other routines and programming ideas. Mark Charlton will continue his section — MARK'S BYTE — in each issue, and we'll also be covering the use of the ZX80 in education.

However, all this costs money, so unfortunately, from now on we'll have to charge. Membership of the National ZX80 Users Club, plus a year's subscription (12 issues) of INTERFACE, is £7.50 for the UK, £10 for Europe, and £13.50 for the USA and elsewhere. It is vital that I do the right thing by all of you who have sent in stamped, addressed envelopes. If you have done this, your subscription for the first year is £2 LESS than the above prices. You'll find a subscription form inside the back cover. There's a box to tick if you've sent me three or more stamped, addressed envelopes plus stamps.

PEEK AND POKE

INTERFACE is your magazine. We want it to fulfill your needs, and reflect your interests. Many, many people have asked us about PEEK and POKE, and the USR function. In this issue, Trevor Sharples takes a look at PEEK and POKE, and tries (very bravely) to explain them in simple (!) English. He's also included a program to illustrate PEEK and POKE in action. We'll look at USR in a future issue.

Please write to me and let me know what you want to see in future editions of the club magazine. We'll try to cover your requests. In the next issue, INTERFACE 6, along with at least six complete programs, we'll look at a way to make your ZX80 make music, complete with full program listing.

For many of you, as you've told me in your letters, the ZX80 is the first computer you've owned. And first-time users need very careful explanations of what is going on. To fill this need, I've written a book — MAKING THE MOST OF YOUR ZX80 — which is available for £5.95. It contains over 60 complete programs, the amazing active display routine, a complete breakdown on the new ROM's features (something for you to read while Uncle Clive gets rich on the interest from all those £19.95's you've sent him), and much, much more. There's a large section on using the ZX80 in the classroom, and many, many hints to help you write your own programs. Step by simple step, the book leads you through programming the ZX80 from very first principles. Sheridan Williams, of *Personal Computer World*, has written the introduction.

We, of course, are selling the book. It is also available from Science of Cambridge. Although Uncle

Clive told me he was unwilling to endorse the book to the extent of writing a preface for it, we consider it quite significant that — out of all the ZX80 books now on the market — MAKING THE MOST OF YOUR ZX80 is the only one that, to date, Mr Sinclair has decided to distribute himself. Tell someone in your family to buy you a copy as a present.

USEFUL ROUTINES

David Ahl, of *Creative Computing*, has also been in touch with me, and some sort of link with ZX80 owners in the USA is likely soon. Mr Ahl, as you probably know, edited the best-selling books BASIC COMPUTER GAMES and MORE BASIC COMPUTER GAMES.

So, as you can see, the future looks very exciting for ZX80 owners. Stay with us, and we'll help you squeeze every bit of possible enjoyment out of your computer. We want to help you grow as programmers and games players, and of course we want you to help us, and other club members, grow as well.

So if you've discovered any useful routines for the ZX80, or you've developed some original programs, please send them in to the club. You'll get full credit for any contribution used, and — if your program is unusual or clever enough — you could make some money from royalties if we decide to include it on one of the users club cassettes.

LOCAL BRANCHES

Please let us know if you set up a local branch of the National ZX80 Users Club in your area or school. We can probably help you with hints and programs, and we'd like to include news about your activities and discoveries in this magazine. Let us know when and where you're meeting, and give us the name and address of the area organiser, so we can help build up each local group as much as possible. If you haven't got a users group in your area yet, why not start one? We'll give you as much assistance as we can, as well as publicising your address.

See you in INTERFACE 6,
Regards,

Tim Hartnell, club-coordinator,

P.S. In the last INTERFACE, Mark asked people to write in and say which tape-recorder they found easy for LOAD and SAVE. In the next issue, we'll publish the results of the survey, plus summarise all the tips on this problem we've gathered since the club has been going. We'll also reprint the sheet S.O.C. send you if you write and ask them about the problem. That is all in the next issue of INTERFACE. Remember, if you don't subscribe (see page 11) you won't hear from us again.

MARK'S BYTE

Hi again. Great to have proper typesetting, isn't it? Classy literature like my column deserves the finest treatment ... Alan Bibby of Seaton, Devon, tells me he bought the ZX80 to teach BASIC in school and relieve the pressure on the main school microcomputer ... I hope his school doesn't have a (hiss) PET or a (boo) Apple ... S.A. Stock, of Somerset says he thinks INTERFACE should provide articles on PEEK, POKE and USR ... well, peeky and perky are in this issue, and USR will be a-coming along soon ... Tim and Jeanette Mariner graduated (?) from the MK14 to the ZX80, and are — like many other club members — interested in games/programs which make good use of the graphics ... so if you've written any programs with more-interesting-than-the-ordinary graphics (what we in the computer trade call M.I.T.T.O. graphics) please send them in to share ... J. Sparkes of Darlington, Co Durham would like to see programs which can be used in school maths lessons ... ugh ... Joe Fitzpatrick has written a routine to display each address, and the character stored in it ... line 30, he points out, prevents the program from crashing when the screen fills up ... Joe's routine:

NO MORE CRASHES

```
10 FOR J = 16424 to 17424
20 LET X = PEEK (J)
30 IF PEEK (16421) < 3 THEN GOSUB 100
40 PRINT J; " * " CHR$ (X); " * " ;
50 NEXT J
60 PRINT
70 PRINT "END"
80 STOP
100 PRINT
110 PRINT "PRESS NEWLINE TO CONTINUE"
120 INPUT AS
130 CLS
140 IF AS = " " THEN RETURN
```

PROBLEM POSED

R. Peel, of Kennington, Oxford, sends in a problem which he says club members might enjoy solving ... a foreman in a factory builds chairs and stools from three components, and must decide the quantities of each to build to get the maximum profit ... try and write a 1K program to solve this problem, and send it into the club if you like for evaluation (we'll give a cassette of 1K programs to the best received) ... the facts for the problem: stock — 156 tubes, 64 blocks 140 slats; unit cost — tubes 5p, blocks 3p, slats 9p; quantity per chair — 4 tubes, 8 blocks, 5 slats; quantity per stool — 3 tubes, 1 block, 4 slats; cost of chair — 89p; selling price — 100p; profit — 11p; cost of stool — 54p; selling price — 58p; profit — 4p ... get to it programmers.

John Courtis of Pimlico has specified quite clearly what programs he wants members to contribute: "... as wide a spread as possible, almost anything which ingenious programming can stuff into Uncle Clives tiny RAM, business/business games/games games etc

... " ... I wonder if "business games" are what they play in Cambridge ... there's a great one S.O.C. play, it's called "promised date of delivery" ... Mr G. Bedford, of St John's, Worcester, is not impressed with the quality of programs published so far in INTERFACE ... He writes: "Could I make a plea that in future, program listings should only be shown that merit it, either by skill, or cunning use of programming?" ... Dennis Bradbury, of Sale, Cheshire, whose FRUIT MACHINE program was published back in INTERFACE TWO, says he'd be interested in an article showing the conversions from other BASICs to Sinclair BASIC ... there is such a table in THE ZX80 MAGIC BOOK, published by TIMEDATA LTD., 57 Swallowdale, Basildon, Essex, SS15 ... this is a fine little book, we'll be reviewing it in a future issue of INTERFACE ... the club has received software from a number of firms, including ECONOSOFT and BUG-BYTE and we'll be reviewing that in future issues, if you've bought any software, please write to me (or Tim, or anyone at the club) and let us know what you think of it, value for money, etc.

SHORT, SAD SIGHES

Peter Croom says he had no problems with his kit, apart from a few soldering mistakes ... if you built your ZX80 from a kit, and have some tips to help other constructors, please let me know ... M.L. Taylor wrote a short, sad letter to Uncle Clive, after reading the first ads in the Sunday Express offering readers ZX80's for £99.95, which — as you may recall — was £10 less than they were being sold through PCW and the other magazines at the time ... I thought you might be interested in hearing part of what Mr Taylor wrote: "... I now note, with distress, that you are currently advertising an assembled ZX80 for £99.95 ... in the Sunday Express ... I am surprised that you offer readers of the Sunday Express a discount of approximately 8% after receiving such a good appraisal in Personal Computer World ... my main reason for purchasing your machine ... I look forward to receiving your comments in the near future and a return of £8.95 ..." ... I believe Mr Taylor is still waiting.

ZX80 Magic Book £4.75

For the 4K ROM ZX80 with 1-4K RAM

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23+23 way ZX80 edge connector ; £3-

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STEPPING OUT WITH KEITH

Keith Lunt, Elvington, York has written two STEP routines:

To step up —

```
10 FOR A = 1 TO 17
20 LET X = 10*A
30 PRINT X
40 NEXT A
```

To step down —

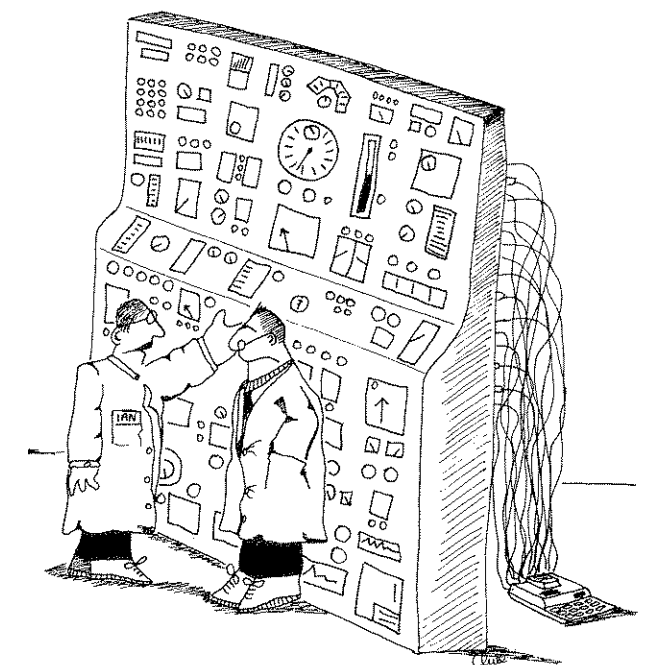
```
10 FOR A = 1 TO 17
20 LET X = 180 - 10*A
30 PRINT X
```

GENEROUS TO A FAULT

D. Kenward, of Ensbury Park, Bournemouth has problems with his ZX80 kit, and reports: "... I spent a careful weekend assembling and trying to get the beast to operate ... A lot of checking revealed one or two suspect solder bridges ... but still no joy, no cursor, just a blank raster. Eventually, after much hunting round with a 'scope I estimated that probably the ROM or IC5 was faulty and returned it grudgingly to Sinclair ... I had taken the precaution of surreptitiously marking every IC ... the ROM and Z80 were unchanged (when it was returned) but five others were new!" They must be generous with their little chippettes at S.O.C ... G.D. Bishop, of Winsford, Cheshire, has more luck. He says: "I assembled it in two hours and found it to be in full working order. I am delighted with its performance ..."

WHEN YOU'RE HOT, YOU'RE HOT

Mr Bishop adds: Many users complain about the regulator IC heat sink getting hot. This problem can be partly overcome by ensuring that the unregulated DC input to the ZX80 is nearer 7V than the higher 11V that is quoted. In fact, about 7.5V is the lowest that is possible without the 5V falling within the ZX80. If this can be achieved, it means that the regulator does not have to dissipate so much power, and so remains cooler. A simple calculation shows that, at 500mA, the 11V input causes about 3 watts to be dissipated, the 7.5V input causes about 1.25 watts and the supplied 9V input causes 2 watts to be dissipated. With no forced cooling, this can generate a lot of heat." ... Hot little ZX80's cause many problems. Uncle C was not amused at a Science of Cambridge press conference when Duncan Scott (who compiles the ZX80 Line-up page in PRACTICAL COMPUTING) made a witty remark about "frying eggs" on his ZX80



Philip Dimon, Gosport, Hampshire, would like someone to write a "bank account program" ... I would like some money so I could have a bank account, then perhaps I would need such a program.

HEDGEHOGS MATE TO DOUBLE K'S

G. Phillips, who contributed the READ/DATA routine in the last INTERFACE (and the first two editions had the "greater than" sign the wrong way round, as many, many correspondents took undue delight in pointing out to me) has added an extra 4K to his first 4K by stacking the 2114's on top of each other (his little drawing looks like hedgehogs mating), soldering all pins except pin 8. Geoff warns that this can overload the power supply, so says extreme care is needed ... so, as someone used to say, keep those cards and letters coming in ... I'll see you next month in the next INTERFACE (you have sent your subscription in haven't you?) ... and I'll leave you with the thought expressed in a letter I got last week; "The best thing about INTERFACE is the deliberate mistakes in the programs. You can learn an awful lot by spotting the mistakes and correcting them ..." ... yes ... uhm ... well bye until next INTERFACE.

MARK CHARLTON

Bricks is a highly original game for the 1K ZX80 from Ole Noerregaard of Denmark. You have to prevent the computer's two robots from breaking through a wall of bricks and mashing you. But all you are armed with is a trowel and a pile of cement and bricks. When the computer prints out "ROW?" you can add one brick only to the wall in any vertical row. Input a number between 1 and 10 (left to right) to make the wall thicker. You have got 10 frantic rounds to survive. Can you do it?

BRICKS

```

2  DIM M(10)
3  DIM N(10)
4  DIM X(2)
5  DIM Y(2)
10 FOR Z=1 TO 10
11 LET M(Z)=9
12 LET N(Z)=1
13 NEXT Z
14 LET X(1)=3
15 LET X(2)=7
16 LET Y(1)=1
17 LET Y(2)=1
18 FOR T=1 TO 10
19 GOSUB 200
40 PRINT
42 PRINT "ROW?"
43 INPUT S
44 LET M(S)=M(S)+1
45 IF RND(5) > 1 THEN LET Y(1)=Y(1)+1
46 IF RND(5) > 1 THEN LET Y(2)=Y(2)+1
50 FOR Z=1 TO 2
52 LET X(Z)=X(Z)+RND(3)-2
53 IF X(Z)=0 THEN LET X(Z)=1

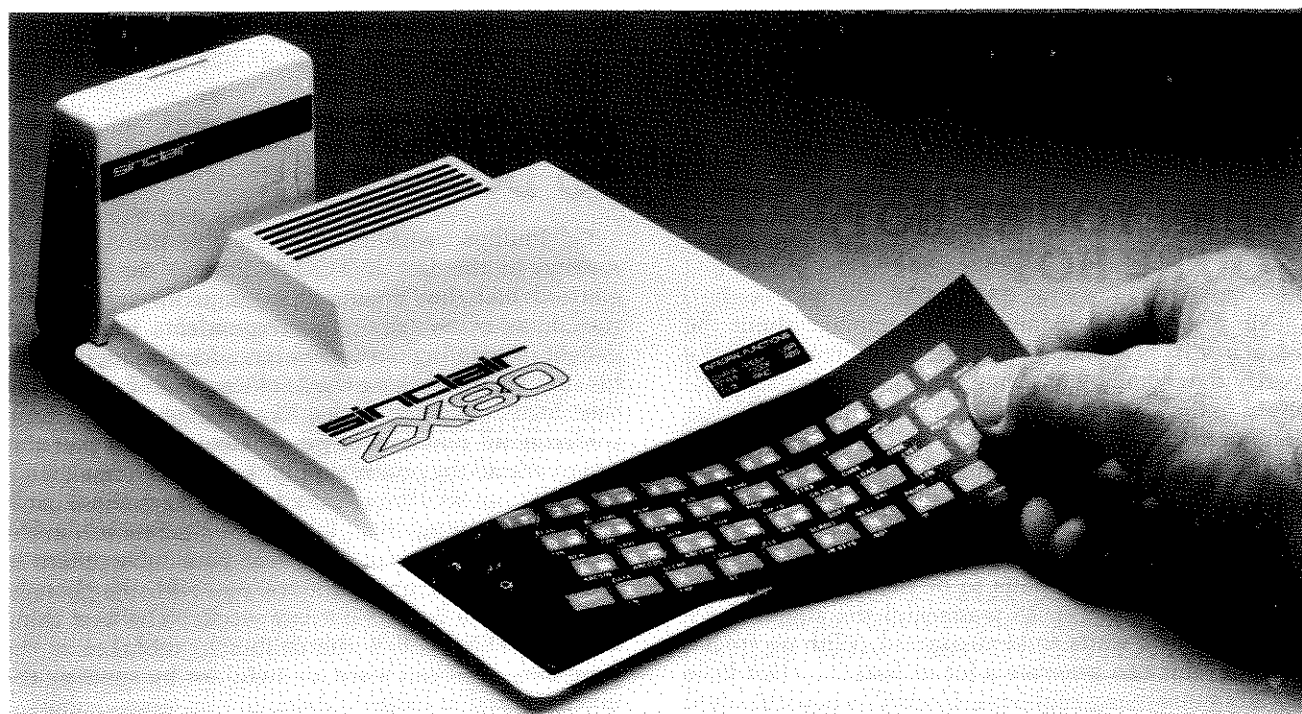
```

```

54 IF X(Z)=11 THEN LET X(Z)=2
56 IF N(X(Z)) < Y(Z) THEN LET
   N(X(Z))=Y(Z)
59 NEXT Z
65 FOR Z=1 TO 10
66 IF NOT N(Z) < M(Z) THEN GOTO 99
67 NEXT Z
68 NEXT T
69 GOSUB 200
70 PRINT "YOU SURVIVED"
71 STOP
99 GOSUB 200
100 PRINT "YOU HAVE BEEN MASHED"
110 STOP
200 CLS
201 PRINT,"BRICKS","MOVE-";T
210 FOR L=1 TO 15
220 FOR S=1 TO 10
230 LET XS=" "
240 IF N(S) < L AND M(S) > L-1 THEN LET
   XS="(shift A)"
250 FOR Z=1 TO 2
260 IF L=Y(Z) AND X(Z)=S THEN LET
   XS="X"
270 NEXT Z
280 PRINT XS;
300 NEXT S
340 PRINT
360 NEXT L
380 RETURN

```

© OLE NOERREGAARD



Sinclair's PR company sent out this picture — of a lucky owner slipping in his new-ROM overlay — before S.O.C. had second thoughts and whipped the ROM off the market. The chunky thing at the back is the 16K RAM pack which is superb value at £49.95. S.O.C. intend to distribute the RAM pack according to their original schedule.

For the more 'clued up' programmer of the ZX80, G. Bedford has written a program to convert program listings to Hex. It is useful in itself to see how Hex works, but it can also be tacked onto other programs to change the Basic listings into Hex. When you run this program, enter the start address (decimal) and then the number of bytes (decimal) of program you want converting. Press newline to continue listing or enter any letter to stop.

HEXADECIMAL PROGRAM LISTING

```

10 PRINT "INPUT START ADDRESS"
20 INPUT A
30 PRINT "INPUT NUMBER OF BYTES"
40 INPUT B
50 CLS
60 PRINT "LISTING";A; "TO";A+B
70 PRINT
80 DIM E(15)
90 PRINT
100 FOR J=0 TO 15
110 LET E(J)=J+28

```

```

120 NEXT J
130 FOR J=0 TO B
140 LET C=PEEK(J+A)
150 IF C > 15 THEN GOTO 250
160 PRINT 0;
170 LET E=C
180 PRINT CHR$(E(E));" * ";
190 NEXT J
200 INPUT XS
210 IF XS=" " THEN GO TO 230
220 STOP
230 LET A=A+B
240 GOTO 50
250 LET D=C/16
260 LET C=C-(D*16)
270 LET E=D
280 PRINT CHR$(E(E));
290 GOTO 170

```

© G. BEDFORD

HIGH STAKES

Have you ever wondered what it must be like to be a Paul Getty? Then look no further than Ian Turtle's program Stock Market. Your chance to play the wheeler-dealer in high finance. Can you make a killing or will you end up on the window ledge with all the others? You start with £5000 and you have to earn your fortune by buying and selling stocks. Tax is charged on money, not on stock values. You sell your stock by entering a negative number when the computer prints "DEALS?". A cheap way to earn enough money to buy your extra memory.

STOCK MARKET

```

10 LET M=5000
20 DIM P(10)
30 DIM S(10)
40 FOR X=1 TO 10
50 LET P(X)=20+RND(80)
60 LET S(X)=0
70 NEXT X
80 RANDOMISE
90 CLS
100 PRINT "FIRM","SHARE
    VALUE","HOLDINGS"

```

```

110 LET SV=0
120 FOR X=1 TO 10
130 PRINT " ";X;" * * * * ";P(X);" * * * ";S(X)
140 LET SV=SV+P(X)*S(X)
150 NEXT X
160 PRINT "MONEY";M
170 PRINT "STOCK VALUE";SV
180 IF M+SV < 1 THEN STOP
190 PRINT
200 PRINT "FIRM"
210 INPUT A
220 IF A=0 THEN GOTO 300
230 PRINT "DEALS"
240 INPUT D
250 IF M-D*(A) < 0 THEN GOTO 240
260 IF S(A)+D < 0 THEN GOTO 240
270 LET M=M-D*(A)
280 LET S(A)=S(A)+D
290 GOTO 80
300 FOR V=1 TO 3
310 FOR X=1 TO 10
320 LET P(X)=P(X)+(RND(13)-7)
330 LET M=M/400
340 IF P(X) < 5 THEN LET P(X)=5
350 NEXT X
360 NEXT V
370 GOTO 80

```

© IAN TURTLE

BUDDY CAN YOU SPARE A ROM?

Clive Sinclair has withdrawn the new 8K ROM. The news was a shock and disappointment to many ZX80 owners. Some reacted angrily. "If you contact Sinclair, please throttle Clive and replace him with his son, who I think is somewhat quicker off the mark" read one particularly acidic letter sent to the club.

Another club member commented: "It strikes me that a very good reason to delay the new ROM is to (a) ensure that software produced by Image Products (Clive's US software development contact) is fully compatible and (b) that the viewdata/prestel/teletex what-have-you adaptor is also available ..."

Why did Science of Cambridge do an about-face, and after a launch which included flying over two representatives from the United States, and a blanket coverage of the press extolling the virtues of the new ROM, suddenly withdraw it? The official answer was promulgated by S.O.C. word-processor: "I am sorry to have to tell you that we will not be in a position to supply an 8K ROM chip within the timescale which was originally quoted to you, and I would like to explain the reasons.

THE REASONS

"During the final stages of development we made a significant technical breakthrough. For the same money we will be able to offer a far more powerful and altogether better 8K ROM capable of driving a printer we are developing, which will be compatible with the ZX80. We expect to have these new ROMs available in production volumes by February or March next year.

"So it hardly seems fair to ask you to spend £20 now on a chip which will be outdated in a matter of months. I hope you will understand that we really are trying to 'play fair' by all our ZX80 customers — however awkward it may be for us all in the short term.

IS IT TRUE?

"As you have expressed an interest in the original 8K ROM, we have re-processed your order for the 8K ROM enhancement. However, should you decide to cancel your order, please send back the enclosed post-paid card. We will refund your money by return of post."

All very fair, and gentlemanly, And actually signed, in person, by Uncle C himself. But is it true? Or is it the whole truth?

A club member comments: "The talk of driving a printer with the ROM seems a trifle peculiar, surely all you need is an I/O port (TIMEDATA make one — or even the cassette ports — see November PCW), plus suitable buffer and a separate ROM to convert to

ASCII ... Have you a method of perhaps prodding Mr Sinclair into releasing his 8K ROMs as promised for those who don't want to wait until March for the 'enhancement'. Maybe the ZX80 Users Club has more push than individual customers ..."

Another letter suggests that people in the electronics trade know that the 8K ROMs were ready for despatch (although the keyboard overlay and new book may not have been) before they were taken off the market.

WHAT PRICE PRINTER?

What sort of printer does Uncle Clive have in mind. In August he said — and at that stage a printer seemed a long, long way away — that S.O.C. intended to produce a printer "at about the same cost as the ZX80". So, that suggests £70 — £100. What sort of market would such a printer have?

Mr S C Adams, a ZX80 owner in London, wrote to Uncle Clive late in October. His letter, perhaps, speaks for many of us. This is what he said:

A LETTER TO CLIVE

"I have just received your letter ... stating your reasons for withdrawing your much-advertised 8K ROM. I would like to say how disappointed I am that you have found it necessary to withdraw this long-awaited improvement for such a small modification. I would like to make the following points which are most likely to be the ZX80 user's reaction.

I WOULD LIKE YOU TO COMPLETE YOUR SIDE OF OUR CONTRACT'

"1/ The ROM gives the ZX80 the best chance to convert other BASIC routines as it gives features like pause, tape names and, most important, floating point arithmetic

"2/ The printer routine involves more expense as it needs a printer to use it (when is the printer coming out?). It is not an urgent requirement by most users as cost was the prime motive for buying the ZX80 in the first place.

"3/ Why is it necessary to withdraw the ROM at all because if it is like the original ROM it contains a window so it can be reprogrammed? All that would be required in February or March would be a reprogramming service such as Transam use for their Triton hobby computer. Meanwhile, we could be using the ROM for those four to five months.

"Finally, I would like to say that seeing as some people have seen the new ROM in action, there must be some available. I would like you to complete your side of our contract and supply me with one. I am not interested in my money back or waiting till at least March to get my new ROM. I would like it now so I can use it."

PEEKING AT POKE

If you can't tell the difference between PEEK and POKE commands and a hole in the ground the don't despair, you are in very good company. To most people the PEEK and POKE commands are shrouded in mystery, a myth that the Sinclair ZX80 manual has perpetuated. I was myself, not so very long ago, in awe of these seemingly incomprehensible commands, but after sitting down and getting to grips with them I not only retained my sanity but I also added a very strong pair of BASIC instructions to my programming skills.

SUITCASES, CABBAGES AND MATCHBOXES

If you imagine a suitcase filled up with neat, ordered rows of empty matchboxes, the first matchbox being labelled "Address 1" and the one next to it "Address 2" and so on, you can build up some sort of idea of the way a computer lays out its "filing system".

When you use the PEEK command on your ZX80, you are telling the computer to look inside a matchbox (address) and tell you the number that is found there. The instruction PRINT PEEK (16425) — which can be entered as a direct command without a line number — will print the number 244 on the screen. The computer has told you that 244 is the number presently stored in matchbox (address) 16425.

A ROUTINE TO SEE PEEKING IN USE

If you give the computer the instruction PRINT CHR\$(PEEK(16425)) it will look inside the address as before, find the number stored there and print the character whose code corresponds to that number. You will find that your computer will print the word PRINT. You can check this by looking on page 77 of your manual. The character for code 244 is PRINT.

A program to show exactly what is going on should help to explain the PEEK command. If you type the following program into your ZX80 you will be able to see the PEEK command in use.

```
50 LET A=16424
60 FOR D=1 TO 10
70 PRINT A, PEEK(A), CHR$(PEEK(A))
80 LET A=A+1
90 NEXT D
```

When you run this program you will see three columns appear on the screen. They should look like this:

16424	0	M
16425	50	LET
16426	240	A
16427	38	=
16428	227	1
16429	29	6
16430	34	4
16431	32	2
16432	30	4
16433	32	

The left hand column is the address numbers. Next to these are the numbers that are stored in each address that you have looked at using the instruction PRINT PEEK(A), and the third column is the characters whose code corresponds to the number found in the address.

ADDRESSES AND NUMBERS ADD TO CONFUSION

Look at the third column and write down the characters in order from top to bottom. Now return to the command mode by pressing any key. If you look at the first line of the program and compare it with the characters you have written down, you will see that they are the same. The exceptions here are address numbers 16424 and 16425. Address 16425 has 50 as the number stored inside it. This you can see is the line number, which the ZX80 stores in a single address preceded by an address with nothing in it at all. When the program is running that tells the computer that the next number is a line number, even though the ZX80 printed the character M when it PEEKed the address.

The ZX80 Companion

SECOND EDITION

ISBN 0 907211 00 3

Price £10.00

This best-selling manual on the ZX80 has been revised and extended to include a new chapter by Dr Ian Logan covering the ZX80 monitor. All useful monitor routines are described and several utility programs are included, particularly a MOVING DISPLAY routine. For your copy send a £10.00 cheque or P.O. to LINSAC.

Orders are also being accepted for the ZX80 Monitor Listing to be published by LINSAC at £10.00 on 23 November. This is a full assembly language listing of the monitor, with annotations.

LINSAC, 68 Barker Road, Linthorpe, Middlesbrough TS5 5ES

What you have done by using this program is to look at each address in ascending order from 16424, to print the number found inside and to print the character whose code corresponds to that number. It matches the first line of the program because the program is stored, character by character, in ascending addresses from 16424 onwards.

So the PEEK command looks inside the address and tells you what is there, but what does the POKE command do? Quite simply, the POKE command changes the number inside the addresses. You have to be careful when using the POKE command, so never POKE an address number less than 16424 unless you really understand the workings of PEEK and POKE.

The POKE command is written in the form POKE A,B where A is the address number and B is the code of the character that you wish to put into the address.

Add the following lines to your program:

```
10 REM.....
20 LET A=16427
30 INPUT B
40 POKE A,B
```

AMAZING CHANGES SEEN IN REM

Now run the program, and when the ZX80 asks you for a number input consult your manual (page 78) and input the code of any one of the graphical characters. The computer will now execute the rest of the program as before, but this time you will see a different set of numbers and characters in the addresses. This is because the first line of the program has changed. Look at address number 16427 on the screen. The code number should be the number that you entered and the character should be the one that you chose from page 78 of the manual.

ZAP! AND DOTS CHANGE TO GRAPHICS

Return to the command mode and look at line 10. Originally the REM statement consisted of 10 dots, but now the first dot has been replaced by the graphical character that you chose. Run the program again and chose a different graphical character this time. You will see that the first graphical character has been replaced by the second one.

So that is how POKE command works. It puts a character of your choice into an address of your choice. You are not limited to just the graphical characters, but you can use any of the characters from pages 75-78 of the manual, as long as the code number is less than 199 and does not include the bank of question marks between 64 and 127.

Change line 30 to INPUT B\$ and add the following lines:

```
32 FOR C=1 TO 10
35 LET B=CODE(B$)
42 LET B$=TLC$(B$)
44 LET A=A+1
48 NEXT C
```

What you have set up is a small string-handling routine. If you run this program the computer will ask you for a string input. Try typing in your first name. When you press newline the computer will take the code of the first letter of the string (your name) and POKE it into address number 16428. It will then take the code of the second letter and POKE it into address 16429. Your ZX80 will continue to do this until it reaches the end of the FOR-NEXT loop.

After the last letter of your name has been POKED into the REM statement, the computer will execute the rest of the program as before. You should see your name spelt out down the right-hand column on the screen. If you don't believe me then return to the command mode and look at the REM statement. Isn't that your name?

To get rid of the bulky routine at the end of the program that prints out a series of PEEK commands to see what is in the REM statement, a simple alternative presents itself.

PEEKING DIRECTLY INTO PRINT

Change line 10 to PRINT "", putting about 20 spaces between the quote marks. You can now get rid of lines 50 onwards and replace them by:

```
50 CLS
60 GOTO 10
```

It is also necessary to change line 20 to let A=16428. Can you see why? Address 16427 was the first address after REM and therefore is the first address after PRINT. However, PRINT is followed by quote marks in address 16427. If you POKE something else into it you will find that you get a syntax error as a PRINT statement must be fully enclosed by quote marks. So to avoid this, it is necessary to set A at 16428. Also, if you add line 37 IF B\$="" THEN STOP, this will enable you to get out of the loop by entering a null string (just pressing newline).

GOODNESS, WHAT WILL THEY POKE NEXT?

Now run the program and type your name again. Pressing newline tells the computer to execute the program, but this time, after POKing the characters into the print statement, the computer obeys line 60 and goes to line 10. Line 10 is the print statement, so the ZX80 should print your name on the screen. If you return to the command mode you will see your name written in the first line. Run the program again and type in another name. You can enter a different name each time the computer prompts for a string input, and see that name printed on the screen.

These are only the basics of how PEEK and POKE work. Next month I will show you how to use the PEEK and POKE commands into use in a program including the simple setting up of a memory-mapped screen.

TREVOR SHARPLES

An amazing game for the mercurial mind of Colin Bodell. You are hopelessly lost in a maze and escape is obviously uppermost in your mind. However, there are hordes of nasty little goblins who don't want to see you go. They charge exorbitant sums of money to pass a variety of obstructions: walls, gates and, you've guessed it, bridges. Your wallet is tuned to the sum of £100 and you have this sneaking suspicion that there are 10 obstructions ahead ... if you get the chance to count all of them.

WALL-GATE-BRIDGE

```
5 LET T=100
10 LET X=1
15 PRINT "WALL *** GATE *** BRIDGE"
20 PRINT
25 IF T=0 OR T < 0 THEN GOTO 600
30 LET A=RND(3)
40 IF A=1 THEN GOTO 60
50 IF A=2 THEN GOTO 110
60 PRINT
70 PRINT "WALL...£10"
75 LET W=10
80 GOTO 300
90 PRINT "GATE...£20"
95 LET W=20
100 GOTO 300
110 PRINT "BRIDGE...£30"
115 LET W=30
120 GOTO 300
130 PRINT
140 PRINT "HOW MUCH OF YOUR £";T;" DO YOU WISH TO GAMBLE?"
150 INPUT M
160 IF RND(2)=1 THEN GOTO 210
```

```
170 PRINT "YOU LOSE, YOU NOW HAVE £";
180 LET T=T-M-(RND(M))
190 PRINT T
200 GOTO 15
210 PRINT "YOU WIN, YOU NOW HAVE £"
220 LET T=T+M+(RND(M))
230 PRINT T
240 GOTO 15
300 PRINT
310 PRINT "DO YOU WISH TO PASS THROUGH - (1)"
320 PRINT "DO YOU WISH TO GAMBLE - (2)"
330 INPUT G
335 CLS
340 IF G=1 THEN GOTO 370
360 GOTO 130
370 PRINT
375 LET X=X+1
380 IF X=10 THEN GOTO 500
385 PRINT "YOU NOW HAVE £";
390 LET T=T-W
400 PRINT T
410 GOTO 15
500 PRINT "YOU HAVE GOT THROUGH WITH £";T
510 PRINT "WELL DONE"
520 STOP
PRINT "YOU RAN OUT OF £££ WITH";10-X;"OBSTRUCTIONS PASSED"
605 PRINT "YOU LOSE"
610 STOP
```

© COLIN BODELL

COMPETITION

Well, not exactly free — unless you win. We're having our first competition, and the winner can choose any TWO cassettes of software listed inside the back cover.

We'll have a competition in each of the future issues of INTERFACE, and will be announcing the winner of this competition in INTERFACE 7 (that is, the one after the next issue).

What you have to do for this competition is to write a program which will convert a message typed into the ZX80 in English into Morse Code.

There are no restrictions at all, except that it must run on a 1K machine.

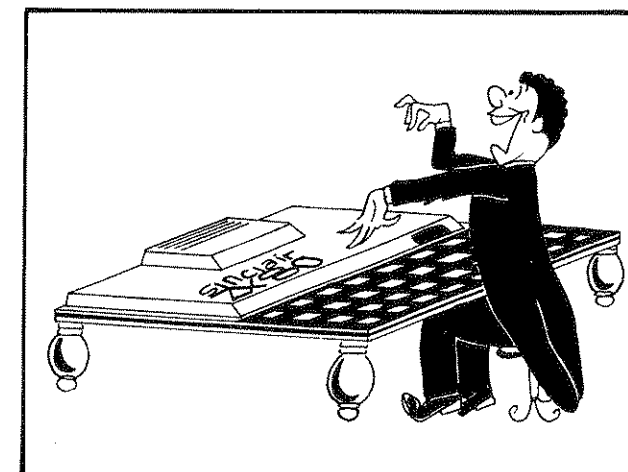
The winner will be the person who writes the shortest program — that is, the one which occupies the least memory.

Please send us a listing of your program, following the national ZX80 Users Club software standards, plus any necessary documentation.

If we get two programs which occupy about the same small amount of RAM, the winner will be the one which, in our opinion, is the most elegant solution to the problem. Note that your program does NOT have to translate Morse back into English.

JOIN THE CLUB

See page 15



LOOKING AT BOOKS

THE ZX80 COMPANION is an excellent title for a book, and Bob's venture into ZX80 literature is about as good as the title.

Bob and friends are obviously people who know their stuff as the book is full of useful information, but this information is not easy to access. The ZX80 Companion is *not* a book for beginners — and I'm sure Bob and co. will agree. If the ZX80 companion was the first book a newcomer to computing saw, he or she would be tempted to turn her (or his) back on computers and move as fast as possible in the opposite direction.

In other words (and without all the brackets) at first glance this book is 'frightening'.

Bob's Brigade have "adapted" and enlarged the last section of Uncle Clive's manual and this forms the nucleus of the book.

If you want to learn how to program in BASIC then skip this review and go on to the next, but if you feel you need an 'in-depth' autopsy of the ZX80 then this book will be immensely useful. Recommended to the 'old sweat' (I know this excellent cure for overheating...) who has some knowledge of the workings of the computer.

The book is, however, a little lacking in programs, perhaps, so there is not much you can actually *do*, but there is a lot to learn. Their maze program is worth a mention — an 'amazingly' good game.

The ZX80 Companion, now in its second edition, is a little bit over-priced at £10, I feel, and has the disadvantage of being stapled rather than spiral bound like Tim's and Fred's books. This means that the book won't lie flat when you're trying to type in a program from it unless you keep it flat with an ashtray (or the PET/TRS-80/APPLE that you keep handy for just that sort of emergency).

Get your brain in gear before you think of buying this book or you will stall at the lights!

30 GAMES FOR THE ZX80 1K

Fred Milgrom has produced a 'no-nonsense' book of 30 programs which, as you would imagine in a book of this type, range from good to bad programs with most falling somewhere in the middle.

Mr Milgrom claims that his book contains 30 programs (if you count Bubble Sorts and other little routines as programs — naughty, naughty Fred) and some of them are certainly worthwhile.

Gomoku is a game that I must mention as it is by far the best program in the book — even if the listing in the first edition didn't work properly. This has now been corrected and the amendments are available on the new, improved unabridged errata sheet in the second edition.

Other games, however, lead you to believe that computers have at last learned how to cheat.

While playing Blackjack, the computer shuffled the cards and came up with a whole deck of nines and kings. How could I win when it kept dealing itself two kings every time?

Each program is well documented, the documentation appearing in the page or so of blurb that preceeds each program.

Fred's programs are of the traditional type: Lunar lander, Pontoon (or Blackjack — Fred has both), Nim, Towers of (yawn!) Hanoi etc. There is nothing really in this book that will appeal to the experienced programmer.

If you feel like shelling out £7.45 for a book of programs then you could do worse. These are all guaranteed to fit a 1K machine and have the advantage that they are written specifically for the ZX80, unlike other books written in Microsoft BASIC which need a lot of converting to make them work.

Watch out David Ahl — Fred Milgrom is coming! MAKING THE MOST OF YOUR ZX80 by Tim Hartnell succeeds where the other two books fail. It has something to offer the established programmer as well as providing a good, solid start in BASIC programming for the beginner. (I must add that I know Tim, so this review may be a little biased).

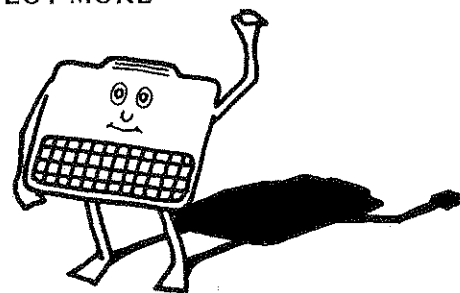
The strength of Tim's book lies in the fact that it contains over 60 programs that are ready-to-run on your ZX80. The programs, at the beginning of the book, are very simple (I'm sure that the more experienced of you will skip the first couple of chapters unless you *really* want to print your name in lights on the screen!) evolving into some really tight, well-programmed stuff towards the end of the book.

Making the Most of Your ZX80 also contains an appendix full of useful and important routines including the by now legendary 'Amazing Active Display' that gives you the closest thing possible to moving graphics on the ZX80.

Tim's book provides a comprehensive coverage of BASIC programming and games development for the ZX80. Worth £5.95 of anyone's money (unless you get a free copy to review!)

ALAN CARR

HELLO, MY NAME'S ZEDDY AND IF YOU BUY THE BOOK, YOU'LL BE SEEING A LOT MORE OF ME.



THE ZX80 IN EDUCATION

Eric Deeson (Highgate School, Balsall Heath Road, Highgate, Birmingham, B12 9DS) is setting up the Education ZX80 Users' Group, under the umbrella of MUSE (Micro Users in Secondary Schools). If you're interested in teaching uses of the ZX80, please send Mr Deeson a stamped addressed envelope.

Mr Deeson's outfit will be, we imagine, the major group for those involved in using the ZX80 in education, and it is hoped that other schools setting up groups will liase with him. We'll have a page in future issues of INTERFACE covering educational uses of the ZX80, and we'll also review educational software in this section.

Meanwhile, J Wakefield (38 Bedford Crescent, St Ives, CAMBS, PE17 6DE) has started a company called ZX80 Junior Education Enterprises, offering, as he says, "reliable programs dealing with specific educational needs, as cheaply as possible". He'll send you a list for an s.a.e. ECONOSOFT (4 The Loont, Winsford, Cheshire, CW7 1EU) are also producing some outstanding educational software.

Tests, exams and assessed homeworks vary widely in difficulty and to try to run a continuous assessment program by adding up and averaging the raw marks

gives a very inaccurate and often unfair picture of the students' performance. Finding the mean and standard deviation values for the tests allows the teacher to calculate standardised scores which can be compared with standardised scores from other tests with confidence and these new scores may be averaged to give a much more meaningful set of results. If the raw scores are standardised such that they have a mean value of 100 and a standard deviation of 15 then the results can be compared directly with the students' IQ scores. This helps the teacher to identify under-achievers. Randle Hurley has a program on cassette which allow the teacher to standardise scores in this way without spending hours with a calculator. The program — which requires 2K of memory — will cope with 4 to 10 groups of 30 students. For details and order form, send s.a.e. to Randle Hurley, 63 Green Way, Chislehurst, Kent, BR7 6AG.

The Users' Club has two educational cassettes for sale. The first — School Pack Maths Quiz — contains a host of useful mathematical demonstration and quiz programs, each needing 1K. The second educational cassette — French Vocabulary, Series One — tests 100 French words (asking for the French equivalent of an English word selected at random, then correcting it if necessary, and scoring the student). These programs are £5.95 each. Order form on page 15.

If you use the ZX80 in the classroom, you've set up a Users Group at your school, or you'd like to move in this direction, please drop us a line, marking your envelope "ZX80 in Education".

ALIEN ATTACK

```

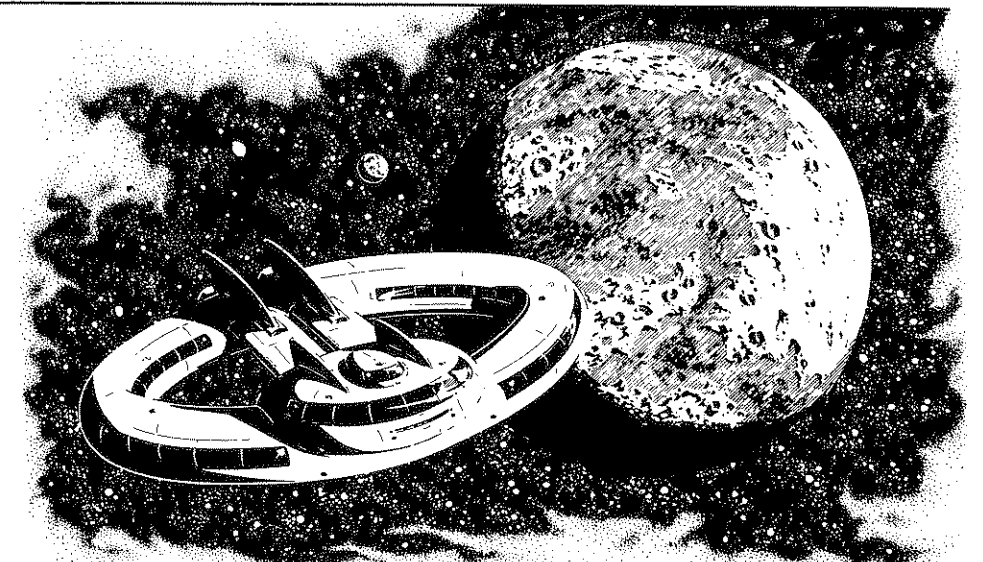
2   LET A=18136
3   LET M=A
5   LET AS="A"
10  LET R=1
20  DIM A(10)
30  LET B=1
40  LET P=0
50  GOSUB 700
60  FOR F=1 TO 5
70  PRINT "...";
72  FOR K=1 TO 29
74  PRINT " ";
76  NEXT K
80  NEXT F
90  GOSUB 700
95  FOR F=1 TO 5
100 LET A(F+5)=A+(F-1)*33+13+RND(5)
110 LET A(F)=A(F+5)+2*RND(5)
115 POKE A(F),24
117 POKE A(F+5),24
120 NEXT F
125 POKE M,27
130 LET M=A + 33*(B-1)
140 POKE M,128
150 INPUT AS
160 IF AS="" THEN GOTO 150
165 GOSUB CODE(AS)*10
167 LET P=P+1
170 FOR F=1 TO 5

```

```

180 LET R=RND(10)
190 POKE A(R),0
200 LET A(R)=A(R)-2
203 IF PEEK (A(R))=27 THEN GOTO 380
205 POKE A(R),24
210 NEXT F
220 GOTO 125
380 PRINT "GAME OVER — SCORE=";P
385 POKE A(R),24
390 STOP
430 IF A(B) > A(B+5) THEN GOTO 480
450 POKE A(B),0
460 LET A(B)=A+(B-1)*33+29

```



```

465 POKE A(B),24
470 RETURN
480 POKE A(B+5),0
490 LET A(B+5)=A+(B-1)*33+30
500 POKE A(B+5),24
510 RETURN
560 RETURN
600 LET B=B-1
605 RETURN
610 LET B=B+1
620 RETURN
700 FOR F=1 TO 32
710 PRINT "(shift W)";
720 NEXT F
730 RETURN

```

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FREE SOFTWARE!

Well, not exactly free — unless you win. We're having our first competition, and the winner can choose any TWO cassettes of software listed inside the back cover.

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What you have to do for this competition is to write a program which will convert a

You too can be Duck Cloggers of the 95th Century with this program of Gerard Allen's. Sitting in your super-sophisticated starship, with a control panel that strongly resembles a ZX80 keyboard, you have got to try to knock the aliens out of the sky before they get you. With true Battlestar Galactica complexity you have five commands to use:— W moves you up the screen; X moves you down and S keeps you stationary (a feat of great ingenuity that only Star Wars has ever emulated). Press F to fire or A to see your score. One command at a time, please gentlemen. This isn't Star Trek you know.

message typed into the ZX80 in English into Morse Code.

There are no restrictions at all, except that it must run on a 1K machine.

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ZX80 CLASSIFIEDS

You can advertise in INTERFACE. Personal ads (contacts, selling off unwanted memory boards, ZX80s and the like) are £2 for the first 20 words, 15p each additional word; business ads (including sale of software) £5 for first 20 words, 20p each additional word. Payment must accompany booking. Display rates on application.

MEMORY EXPANSION BOARDS — special offer. 3K RAM boards, only £8, RAM chips just £7 per K. Take advantage of this special offer to expand your ZX80. Quicksilva, 56 Bedford Place, Southampton, Hants.

BACK ISSUES INTERFACE — Issues number 1, 2 and 3 wanted for copying. Please send — their return is guaranteed — to Brian Theasby, 44 Patterdale Street, Hartlepool, Cleveland, TS25 1RF

OVERHEATING CAN DESTROY ZX80s. For a cure (no unsightly mods) send your machine and £5 to M Wyllie, 24

Oak Grove, Hertford. Also from M Wyllie: Circuits for buffer and RAM, and for adding up to 128 I/O ports to the ZX80. At the moment, he's using the I/O board to run a CREED printer from his ZX80. Circuits 20p each, plus s.a.e. MOVING GRAPHICS using external circuitry. Circuit diagrams, details and three programs, just £2 from Martin Orme, 24 Margaret Gardens, Egloshayle, WADEBRIDGE, Cornwall.

1K GAME PROGRAMS (LISTINGS) FOR SALE. Includes UFO INVADER, GRID GAME, ACEY DEUCY and MATHS TESTER (with time limit). S.A.E. for details to C. James, 27 Portalnd Road, London, W11 (Note from Tim: I've had a look at these programs and they seem definitely worth while). Also, C (stands for Conrad) would like to get in touch with other ZX80 users around his own age (14).

RENUMBER program for the ZX80, takes up half a K, rennumbers GOTOs and GOSUBS and line numbers in steps of 10, or as required. £2.50 for the listing from R Dale, 20 Blythe Avenue, Meir Heath, Stoke-on-Trent, Staffordshire, ST3 7JY.

43 KEY KEYBOARDS for your ZX80. Includes 2 shift and 2 newline keys plus a one action rubout key. Send s.a.e. for details to: Database Consultancy, 105 Fairholme Avenue, Gidea Park, Romford, Essex, RM2 5UR.

Bug-byte ZX80 Software

ON HIGH QUALITY C12 CASSETTE — ONLY £3 per cassette inc.

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 - 5) Guess&gamble; number-sort; treasure-hunt; fruit machine.
 - 6) Secret codes; horse race; stopwatch.
 - 7) Breakout; number puzzle; hex. loader.
 - 8) ZX80 art (3programs) and picture drawing (all use memory-mapped video)
 - 9) Logic gates; 7 segment display; binary to decimal converter.
 - 10) Graph-plotter; summation; histograms; square root.

ZX80 PROGRAMMING COURSE : Book & cassette of programs explains with many useful examples, PEEK, POKE, USR, arrays, flowcharts etc. £7.50 inc.

BUG-BYTE: 251, HENLEY ROAD, COVENTRY CV2 1BX.

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Please complete form at the foot of this page.

Please send me the following:

- () The next 12 issues of INTERFACE. I enclose £7.50 (UK), £9.50 (Europe) or £13.50 (elsewhere). £.....
- () I sent Tim Hartnell three or more stamped, addressed envelopes, plus stamps. Deduct £2 from above prices. £.....
- () copies of the book "MAKING THE MOST OF YOUR ZX80" (containing over 60 programs) £5.95 each £.....

National ZX80 Users Club
Unit 3, 33 Woodthorpe Road,
Ashford, Middlesex, TW15 2RP

Name
Address

(Make cheques payable to: National ZX80 Users Club)

... please send this page, or a copy if you don't want to cut up your INTERFACE ...

4K PROGRAMS:

- () **HYPERGAMES PACK 4KAA1** — Draughts (3 levels of play, full graphics), and Labyrinth (adventure) (£5.95) £.....
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- () **School Pack Maths Quiz** (£5.95) £.....
- () **French Vocabulary** (tests 100 words) (£5.95) £.....

I enclose a total of £