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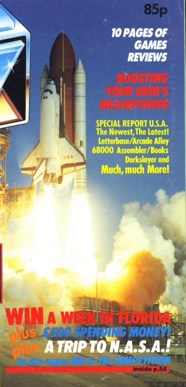

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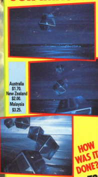

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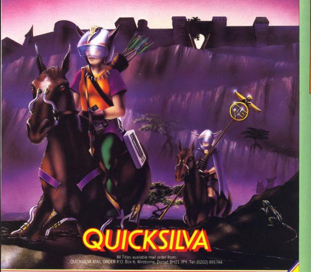

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BACK IN THE U.S.A.

The Chicago C.E.S. was a non-event (see p. 12). Oppressed by the failure of Adam and the IBM PCjr, and mesmerised by the dominance of the CBM 64, the Cousins are floundering. Perhaps decent games aren't so much a matter of technology as good design sense. So how come us Brits haven't yet broken through Over There? Maybe next year . . .

TONY TYLER

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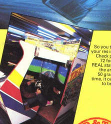

So you think your res is hi? Check page 72 for the REAL state of the art. At 50 grand a time, it ought to be . . .

TX-1 is the flashest arcade game yet (p. 88). Three simultaneous screens bring Le Mans pizazz to your hometown.

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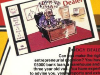

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YES, BUT WILL IT WORD PROCESS?

SEIKO ARE selling what must be the smallest, most portable computer in the world — but you can't play games on it. Yet. But you will when they bring out a larger electronic base-station early next year.

The Seiko Data 2000 is the first true computer-in-wristwatch, as opposed to just being a glorified calculator. It can hold 2,000 characters in a "notepad" memory — the equivalent of around a page of Big K. So far only data can be entered via an associated pocket keyboard — it can't be programmed. But for around £129.50 it's not bad! And when the next, larger base-station is available it will be possible to program with it in a very, very limited dialect of MBasic.

And the Seiko reps who have so far been using Data 2000 to keep their appointments, or important telephone numbers, or just keeping tabs on the numbers sold so far reckon that they have come up with a novel game using Data 2000 — trying to find that important detail in the recess of the Personal Data Bank's twin memory.

The four-line screen displays ten characters per line. A pocket notepad, out in the spring, will up this to a videogame-playing sized screen. And then Seiko will begin to sell portable games, a spokesman said, which are entered from the base-station and played wherever you want . . .

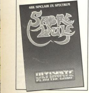
WULF AT THE DOOR

ULTIMATE HAVE done it again.

Following the success of *Atic Atac* and *Lunar Jetman*, the Ashby-based company, thought by some to be the pre-eminent games designers in the country, have launched *Sabre Wulf* as their follow-up. However the price has been increased from £5.50 to £9.95 to reflect 'increased development time'.

Sabre Wulf is the most brilliantly-coloured and polished offering from Ultimate to date. Set in a fantasy jungle, it follows the general Atic Atac format with high-speed moving, fast decision-making, crystal-clear animation and graphics, easy storyline, and all the overall finesse generally expected of Ultimate.

Advance orders indicate that by the time you read this, the game will have been in the national best-selling charts for some weeks.



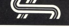
DRAGON FAILS TO DRAG ON

DRAGON 32 OWNERS will continue to receive support and servicing for their machine into the foreseeable future — though it now seems likely that new software for the ill-fated Welsh machine will dry up before long.

The 6809-driven Dragon, whose crash six weeks ago had been widely predicted, failed because its initial lead in sales dried up once Acorn and Sinclair came properly on-line with the BBC and Spectrum computers. Hampered since then by its unusual processor, its lack of lower-case letters and other curiosa, the dragon nonetheless possessed an excellent BASIC and was widely liked by its estimated 150,000 users. However it never recovered its early promise and despite massive injections of cash went under in early June.

However Dragon peripheral and software makers like Compusense have promised to support the machine for as long as users desire them to. It is thought likely that while existing Dragon titles on other makers' catalogues will continue to be sold, new games for the machine are not now very likely to appear in great numbers.

(N.B.: BIG K will continue to print Dragon program listings for as long as we continue to receive them.)

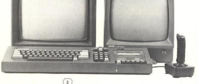


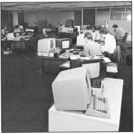
HARDWARE WARS PART 89

WITH arrival of the long-awaited Amstrad Softspot are announcing a series of Amstrad games — among the first companies to do so.

The plot: Uncle Claude of Sincrum Research is threatening to increase the price of his electrical goods and workers' jobs are at stake. "ELECTRO FREDDIE" must push the goods onto the conveyor belt to be packed. You must crush the avuncular Claude with his own products whilst ducking his barrage of Spectrims and Oracs. Dead subtle, this stuff.

There are 11 levels, key option, moving force barrier and custard pies. This method of inter-rival vitriol chucking could run and run! Let's see if it causes a response from the beneficial patriarch. And let's see what flak the Amstrad gets back!





IMAGINE NO POSSESSIONS (Part 2)

GAMES SOFTWARE market leader Imagine is in difficulty. In recent weeks it has sold off its back catalogue of best-selling, titles, delayed the launch of its 'Megagames', has had to close one of its plush headquarters buildings, has laid off staff and is now becoming embroiled in several legal tangles.

Imagine admits that "difficulties" followed repayment of a reported £200,000 to publishers Marshal Cavendish for games written on contract (they were rejected). And a special contracts division, costing some £500,000 to establish, has failed to take off.

The recent seasonal slump in games' sales hit Imagine among others and is thought to have contributed to a severe cash shortage. While he would not comment on details, Tim Best, an Imagine spokesman, did reckon that "The death knell is beginning to sound" for many games software houses, not least because of the low standard of many products.

Imagine has slimmed down its sales and distribution teams, now selling only the latest titles *Cosmic Cruiser* and *BC Bill*. It has laid off at least ten staff and has closed down its internal art department, known as Studio Sting. But Best claimed that "we will gear up and expand again when the Megagames are launched."

This means that Imagine's next, deluxe games range has, to date been delayed for at least two months. The price is now expected to be down from £30 to around £20.

The company's plush five-storey headquarters in Liverpool's City Centre at 5 Sir Thomas Street were vacated last month.

WHAT'S GOING ON?

"IMAGINE PROGRAMMER Mike Glover has come up with an Injectaload program which makes Commodore 64 loading as fast as disc." (From an Imagine handout)

"Melbourne House have developed . . . the Pavloda System specifically for the Commodore 64 which enables cassette programs to be loaded at the same speed as programs from disc."

(From a Melbourne House handout)

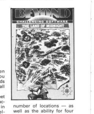
That's nothing. We here at BIG K, using a unique system, have now developed our own way of getting Commodore 64 disc drives to load "at least as fast" as a standard Taiwan-made cassette recorder. The system, codenamed BELTIT, is still in the "experimental" stage but inside sources confidently expect the technique to be marketed later this year by the newly-formed Big Steal Software. Expect similar announcements from other magazines soon.

HOOLIGAN

WORLD CUP, a 3D soccer arcade game for the Spectrum by Artic, has hit the stands at £6.95.

Players may select from 40 teams. Artic claim great graphics. Features include optional continuous music, practice mode, pause action. Bring your own rattle and/or woolly scarf. No mob violence tolerated. Oh all right — just a bit.

NOW IT CAN BE TOLD...



IN CASE you've been wondering (what — you haven't?) just who the Lords of Midnight are, or were, all has been revealed.

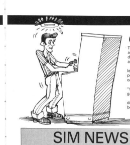
No, not a New York street gang of Puerto Rican extraction, but a new concept in computer gaming, developed by ace Scouse programmer Mike Singleton for Beyond Software.

The Lords of Midnight are you, plus as many of your cronies as want to come along. Described as an 'Epic Game' — as opposed to an Adventure — the prog bears certain similarities to the standard adventure format (graphically enhanced), such as *The Hobbit*, but differs markedly in that instead of phrase choice being left to the player, Singleton has devised a series of constantly-updated multiple choices, to be responded to via a special keyboard overlay. As a result he has been able to cram in an immense number of locations — as well as the ability for four players to take part at once with equal status.

These four can in turn generate or activate new characters which thereafter respond to the same schematic.

Though Singleton is shy about his sources, *The Lord of Midnight* is the most Tolkienian computer scenario yet — it bears a far closer resemblance to a compound of *The Silmarillion* and *The Lord of the Rings* than *The Hobbit* does to *The Hobbit*.

How does it play? "Complicated" is the best word. Visuals are produced by "landscaping", so that where a character looks, what he sees is what he sees.



GO! AND SIN NO MORE!

THE STARTLING NEWS has reached BIG K that Gamblers Anonymous are undertaking a survey of electronic gaming machines in amusement arcades. Why? to investigate the detrimental effect which they might have on the young and gullible. And this study will also take in some of the more "addictive" videogames, according to a G.A. spokesman.

Why the concern? "Young people are spending too much time in amusement arcades, learning habits that might take a lifetime to lose," he said. "We're seeing far more young people now, because gambling electronically is not as well regulated as going into a casino or bookie's."

The Law ("Be upstanding") says that people under the age of 18 should not be allowed "to game", or gamble, in amusement arcades. This definition doesn't include playing games though, only those where you bet and may win back — or lose — money!

So if a kindly soul down the arcade taps you on the shoulder and asks you to repent, don't sock him in the mouth. S/he might be a researcher from G.A. looking out for your best interests — not taking away your free plays!

SIM NEWS

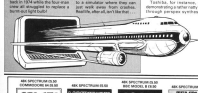
A SIMULATOR which will help investigators "pick-up-the-pieces" after an airline crash, rather than teaching the pilot not to crash in the first place as most of today's simulators are designed to do, has been unveiled by NASA.

The $15 million Man-Vehicle Systems Research Facility (MVSRF, or Mavis for short) takes flight simulation that last, catastrophic step further. It is intended to test the reactions of pilots under stress.

For instance, one plane took hundreds of people to their deaths in the Florida Everglades back in 1974 while the four-man crew all struggled to replace a burnt-out light bulb!

Already this simulator has been employed to design the — safer — cockpit of the future, dubbed LN-1995. Here pilots have more room to move around the desk-top computer-controlled flight panel. One reason for changing to this more office-like cabin was the revelation that pilots trained on simulators actually believed that a real plane was, in effect, a giant simulator, when they got into difficulties.

So, before the new, safer cabin is ready, NASA will train pilots on a composite of the old and the new so that pilots don't have a chance to become accustomed to a simulator where they can just walk away from crashes. Real life, after all, isn't like that . . .



MSX New video/laser bolt-ons announced at CES

A "PLUG" from a micro into a laser-driven videodisc player, shown in London for the first time by JVC in May, will eventually allow computer games to incorporate animated cartoons or real live film for no more extra cost than this hardware.

JVC is one of more than a dozen Japanese suppliers which are launching compatible, MSX micros — sold on their abilities to run the same software across machines from different suppliers. And at the Consumer Electronics show it became obvious that the real difference between MSX micros will be the fancy peripherals which can be latched onto them.

Toshiba, for instance, was demonstrating a rather natty see-through perspex synthesiser keyboard which can be programmed for any combination of sounds from the MSX.

But the *Birdie Try* demo was the most fascinating. The player selects a number of options — the wide direction, the power of a shot, its course and even the iron employed — from which the JVC MSX micro then computes the shot. The videodisc whirrs into action and the actual shot is then displayed. Up to 600 different shots can be stored on each videodisc. After each shot your score, or handicap is displayed.

As a JVC person pointed out, "*Birdie Try* combines the two major obsessions of the Japanese businessman — electronics and golf!" But they're the only ones who can have the actual technology now, in this case the £230 VHD interface unit B7550 'MSX-to-videodisc player, is not yet planned for Europe, but the MSX micro will be here in October priced around £300.

JVC are developing interactive laser disc games, which will show the action a split-second after it's been programmed — these are expected to be on sale in Japan by the autumn, but its not known when they will reach our shores either.

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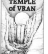

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U.S. EVERY WHICH WAY AT CHICAGO 'PUTERFEST

What you get in *Mission to Moscow*, a fashionably paranoid World War 3 "game" now on sale in the US.

CONFUSION REIGNED among computer and software manufacturers at this year's Chicago Consumer Electronics Show (*reports RICHARD BURTON*). While little radically new was shown, in either hard- or software form, established American giants appeared to be marking time, or even making further ill-advised decisions.

Atari, against all expectations, have weighed in with yet another dedicated videogame system, the Pro-System 7800 (albeit with optional bolt-on keyboard), at a time when they have already lost a substantial share of the budget US home computer market to the Commodore 64.

Commodore themselves have produced two new models at the lower-priced end, the Plus Four — apparently targeted on the same small-business user as Sinclair's QL — and the Commodore 16, widely seen as a revamped Vic-20 in a new case. While Coleco, who have made their own impact in the past, are still avowing support for the Adam system, despite poor performance in the machine's first six months of sales.

The Commodore 64 is now the dominant machine in the US domestic scene; most other competition is fading fast. And the advent of MSX has left US manufacturers responding in various ways. While some have to date ignored MSX, Activision have announced an upcoming range of MSX titles. Imagic, after a shaky year, continue to bring out new games for the IBM PC jr ("Peanut") — another much-boosted machine with disappointing sales performance.

UK manufacturers were barely represented at the Show, with only Quicksilva and Virgin in any way conspicuous,. But British buyers were adamant that the UK has little if anything to learn from the US in the games-writing field.

Full report p.12.

THEY'RE CUMMIN' TO GETCHA

DOMESTIC ROBOTS are catching on — but experts say that they're still a couple of years away from being in the shops.

Firms such as Electrolux, the cleaning appliance giant, and Qualcast, the lawn-mower people, have retained the services of the Cranfield Institute of Technology to investigate. They have two prototype designs: a guided robot which follows wiring along the floor to complete a set task; and a free-roaming device replete with ultrasonic and infrared communications with its computer brain.

A dozen "hobby" robots are now coming on the market for £10 to £2,500. And the domestic variety should add no more than £35-£100 on top of the cost of most household items, according to workers at Cranfield . . . when they're in control!

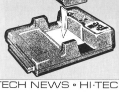
Somehow we think there's a whiff of optimism around.

Atari Announce New Chip-Wrapper

POLE POSITION, Atari's best selling race-car game, is coming out on Spectrum, BBC Model B (£14.95) and CBM 64 (£24.99). Now get this! You will also acquire a FREE GRAND PRIX POSTER! WOW! So if you want to cover up that chink in the wall or would like a lively change of chip-wrapper — go for it!

The price stays at £29.99.

I·TECH NEWS • HI·TECH NEWS • HI TECH NEWS • H



GF's Protocol 4
rogrammable Stick — it
ses "credit cards".

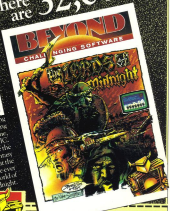
AGF HARDWARE'S PROTOCOL 4 is a programmable joystick interface that gives compatibility between any joystick or trackball and absolutely any Spectrum software. The system comes on dedicated credit card style cards, of which four are supplied on purchase, plus one blank, programmable card. The PROTOCOL 4 will cost £29.95. Enquiries to 0243 823337.

SPRITE-SMITTEN 64 owners can now go get Go-Sprite. The new sprite editor from Mirrorsoft enables simple animation of up to 32 sprites with 255 frames. You can file your sprites by night on disc or tape, or display by day with the data display option. You can operate the whole gizmo with one joystick, and the prog has light pen and keyboard options. Go forth and multiply.

ORIC GOES ape with disc-ware! Combatting the deadly dearth of discs, Oric's new Hitachi-based 3" disc drive system has finally arrived with a starter pack comprising both biz and games disc software. The widget checks in at £299.95, which includes *Frog Hop, Star Ship Valiant, Rat-Splat,* and a *Chess* game featuring voice synthesis.

II·TECH NEWS • HI·TECH NEWS • HI TECH NEWS • H

We can't show you all the views of the Lords of Midnight, there are 32,000!



We've invented a new programming technique called Landscaping, creating a completely new kind of game, the EPIC.

You'll get the chance to shape the characters into your own fantasy novel by playing out the different rôles in the ever changing world of Midnight.

BEYOND

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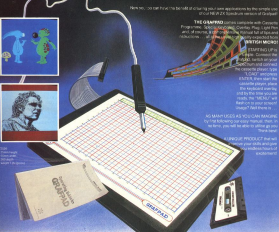

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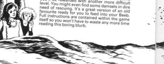
MINES!

```
  10 REM ** Minefield by D. Lucas **
  20 ON ERROR GOTO 30
  30 MODE7
  40 CLEAR
  50 PROCtitlepage
  60 PROCdefchar:PROCinit
  70 REPEAT
  80 MODE7
  90 PROChighscore
 100 LEV%=20:Score%=0
 110 MODE2
 120 IFLEV%>50THENLEV%=50
 130 PROCscreen
 140 H%=TRUE:X=9:Y=29:X1=0:Y1=0:TIME=0:
die%=FALSE
 150 Bonus%=250
 160 REPEAT
 170 IF die% THEN END
 180 COLOUR6
 190 PRINTTAB(X,Y)CHR$248
 200 PROCnearmines
 210 COLOUR3:PRINTTAB(15,1);INT(TIME/10
0)
 220 Bonus%=Bonus%-1:IFBonus%<0 Bonus%=
0
 230 PRINTTAB(6,2);Bonus%;" "
 240 IF INKEY(-98)  THEN PROCleft
 250 IF INKEY(-67)  THEN PROCright
 260 IF INKEY(-73)  THEN PROCup
 270 IF INKEY(-105) THEN PROCdown
 280 IF INKEY(-85)ANDH% THEN PROChelp
 290 UNTIL die% OR Y=4
 300 IFY=4THENLEV%=LEV%+5:Score%=Score%
+Bonus%:GOTO120
 310 PROCdead
 320 UNTIL FALSE
 330 DEFPROCleft
 340 PROCcords:PROCcheck(X-1,Y):VDU5
 350 IFCHAR=151OR CHAR=148THENdie%=TRUE
 360 IFCHAR=146THEN:Score%=Score%+50
 370 FORL%=1TO4
 380 SOUND&11,-10,L%*10+50,2
 390 X%=X%-8:MOVEX%,Y%:VDU18,0,0,255,18
,0,6,8,254:PROCdel
 400 X%=X%-8:MOVEX%,Y%:VDU18,0,0,255,18
,0,6,8,253:PROCdel
 410 NEXTL%:X1=-1:VDU4:PROCcirc:ENDPROC
 420 DEFPROCright
 430 PROCcords:PROCcheck(X+1,Y):VDU5
 440 IFCHAR=151OR CHAR=148THENdie%=TRUE
 450 IFCHAR=146THEN:Score%=Score%+50
 460 FORL%=1TO4
 470 SOUND&11,-10,60-L%*10,2
 480 X%=X%+8:MOVEX%,Y%:VDU18,0,0,255,18
,0,6,8,250:PROCdel
 490 X%=X%+8:MOVEX%,Y%:VDU18,0,0,255,18
,0,6,8,249:PROCdel
 500 NEXTL%:X1=1:VDU4:PROCcirc:ENDPROC
 510 DEFPROCdown
 520 PROCcords:PROCcheck(X,Y+1):VDU5
 530 IFCHAR=151OR CHAR=148THENdie%=TRUE
 540 IFCHAR=146THEN:Score%=Score%+50
 550 FORL%=1TO4
 560 SOUND&11,-10,150-10*L%,2
 570 MOVEX%,Y%:VDU18,0,0,255:Y%=Y%-4:MO
VEX%,Y%:VDU18,0,6,251:PROCdel
 580 MOVEX%,Y%:VDU18,0,0,255:Y%=Y%-4:MO
VEX%,Y%:VDU18,0,6,252:PROCdel
 590 NEXTL%:Y1=1:VDU4:PROCcirc:ENDPROC
 600 DEFPROCup
 610 PROCcords:PROCcheck(X,Y-1):VDU5
 620 IFCHAR=151OR CHAR=148THENdie%=TRUE
 630 IFCHAR=146THEN:Score%=Score%+50
 640 FORL%=1TO4
 650 SOUND&11,-10,L%*10+100,2
 660 MOVEX%,Y%:VDU18,0,0,255:Y%=Y%+4:MO
VEX%,Y%:VDU18,0,6,251:PROCdel
```

```
 670 MOVEX%,Y%:VDU18,0,0,255:Y%=Y%+4:MO
VEX%,Y%:VDU18,0,6,252:PROCdel
 680 NEXTL%:Y1=-1:VDU4:PROCcirc:ENDPROC
 690 DEFPROChelp
 700 VDU19,2,0;0;:TIME=0:REPEAT UNTIL T
IME>100:VDU19,2,2;0;
 710 H%=FALSE:Bonus%=Bonus%-20:ENDPROC
 720 DEFPROCcords:X%=X*64:Y%=1023-32*Y:
ENDPROC
 730 DEFPROCcirc:COLOUR7:PRINTTAB(X,Y)C
HR$243:X=X+X1:Y=Y+Y1:X1=0:Y1=0:ENDPROC
 740 DEFPROCdel:FORDE%=0TO100:NEXT:ENDP
ROC
 750 DEFPROCcheck(X1%,Y1%)
 760 LOCALA%:PRINTTAB(X1%,Y1%);:A%=135:
CHAR=(USR(&FFF4)AND&FF00)/&100
 770 ENDPROC
 780 DEFPROCnearmines
 790 Mine=0
 800 PROCcheck(X+1,Y):IFCHAR=151OR CHAR
=148 THEN Mine=Mine+1
 810 PROCcheck(X-1,Y):IFCHAR=151OR CHAR
=148 THEN Mine=Mine+1
 820 PROCcheck(X,Y-1):IFCHAR=151OR CHAR
=148 THEN Mine=Mine+1
 830 PROCcheck(X,Y+1):IFCHAR=151OR CHAR
=148 THEN Mine=Mine+1
 840 COLOUR4:PRINTTAB(16,0);Mine
 850 ENDPROC
 860 DEFPROCdead
 870 SOUND0,1,100,100
 880 FORM=0TO100:VDU23,0,2,97,0;0;0;
 890 FORDE%=0TO50:NEXT
 900 VDU23,0,2,99,0;0;0;:NEXT
 910 PROCcheckhigh
 920 ENDPROC
 930DEFPROCscreen
 940 CLS
 950VDU19,0,2;0;4,23;8202;0;0;0;
 960COLOUR5:FORM%=4TO29:PRINTTAB(0,M%)C
HR$247;TAB(19,M%)CHR$247:NEXTM%:FORM%=0T
07:PRINTTAB(M%,4)CHR$247;TAB(M%,29)CHR$2
47;TAB(M%+12,4)CHR$247;TAB(M%+12,29)CHR$
247:NEXT:FORM%=7TO12:PRINTTAB(M%,30)CHR$
247:NEXT
 970 COLOUR4:PRINTTAB(3,0)"NEARBY MINES
:";0:COLOUR3:PRINTTAB(0,1)"SCORE:   TIM
E:  ";TAB(0,2);"BONUS:";TAB(6,1);Score%:
COLOUR14:PRINTTAB(9,3)CHR$245;CHR$246;
```

for BBC by DANIEL LUCAS

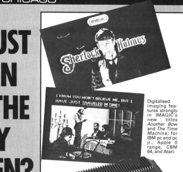
Tread carefully, danger lies all around. Pity you can't see it but that's the way in these minefields. Take it easy and reach the other side safely and you'll be rewarded with another more difficult level. You might even find some damsels in dire need of rescuing. It's a great version of an old favourite ready for you to feed into your Beeb. Full instructions are contained within the game itself so you won't have to waste any more time reading this boring blurb.



```
  980 PROCmines
  990 IFLEV%>30THENCOLOURS:PRINTTAB(6,16
)CHR$242;TAB(14,16);CHR$242:VDU7
 1000 ENDPROC
 1010 DEFPROCmines
 1020 COLOUR2:FORM%=0TOLEV%:X%=RND(18):Y
%=RND(24)+4:PRINTTAB(X%,Y%);CHR$244:NEXT
M%
 1030 VDU19,2,0;0;:TIME=0:REPEAT UNTIL T
IME>100:VDU19,2,2;0;
 1040 ENDPROC
 1050 DEFPROCinit
 1060 DIMName$(10),Score%(10)
 1070 FORL%=1TO10
 1080 Name$(L%)="BIG K":Score%(L%)=0
 1090 NEXT
 1100 *FX10,10
 1110 ENVELOPE1,8,1,-1,1,1,1,1,121,-10,-
5,-2,120,120
 1120 ENDPROC
 1130 DEFPROCcheckhigh
 1140 VDU22,7
 1150 C%=0:REPEAT
 1160 C%=C%+1
 1170 UNTILScore%>Score%(C%)ORC%>9
 1180 IFC%>9THENENDPROC
 1190 PRINT"YOU'RE IN THE HIGH SCORE TAB
LE"
 1200 *FX15,1
 1210 INPUT"YOUR NAME PLEASE",Name$
 1220 Name$=LEFT$(Name$,15)
 1230 FORL%=9TOC%STEP-1:Score%(L%)=Score
%(L%-1):Name$(L%)=Name$(L%-1):NEXT
```

```
 1240 Name$(C%)=Name$:Score%(C%)=Score%
 1250 ENDPROC
 1260 DEFPROChighscore
 1270 FORT%=1TO2:PRINTTAB(5,T%);CHR$141;
CHR$133;"MINEFIELD HIGH SCORES":NEXT
 1280 FORL%=1TO9
 1290 PRINTTAB(2,L%+5);CHR$(128+RND(7));
L%;" ";Name$(L%);TAB(25);Score%(L%)
 1300 NEXT
 1310 PRINT''TAB(5);CHR$130;"PRESS SPACE
 TO START"
 1320 REPEATUNTILGET=32
 1330 ENDPROC
 1340 DEFPROCdefchar
 1350VDU23,248,24,24,126,90,24,60,36,102
,23,249,24,24,28,26,24,124,68,6,23,250,2
4,24,30,24,24,28,22,24,23,251,24,26,126,
88,24,60,38,96,23,252,24,88,126,26,24,60
,100,6,23,253,24,24,56,88,24,62,34,96,23
,254,24,24,120,24,24,56,104,24
 1360VDU23,255,255,255,255,255,255,255,2
55,255,23,247,129,66,36,24,24,36,66,129,
23,246,0,0,151,244,150,148,151,0,23,245,
0,0,174,170,234,170,174,0,23,244,0,0,0,0
,60,60,255,255,23,243,60,126,255,255,255
,255,126,60
 1370 VDU23,242,24,24,126,24,60,126,36,1
02
 1380 ENDPROC
 1390 DEFPROCtitlepage
 1400 CLS
 1410 FORM=1TO2:PRINTTAB(7,M);CHR$141;CH
R$130;"MINEFIELD INSTRUCTIONS":NEXT
 1420 PRINTTAB(1,4)"The object of this g
ame is to move your";
 1430 PRINT"man through the minefield to
 ";CHR$130;"'HOME'."
 1440 PRINT"However you can't actually s
ee the mines";
 1450 PRINT"and the only indication you
have of      where a mine is, is given by
 your mine  detector. This tells you how
 many mines are immediatly next to you."
 1460 PRINT'" Before the game starts you
 are given a brief look at the layout of
 the mines   and there is a help button
which flashesthe layout on the screen fo
r a short    period, you get one of thos
e per sheet"
 1470 PRINT"and it costs you twenty poin
ts."
 1480 PRINT'" When you start to get good
 i.e. after  the third sheet you are giv
en two       damsels in distress which y
ou can rescuefor an extra 50 points each
."
 1490 PROCspace
 1500 CLS
 1510 FORM=1TO2:PRINTTAB(7,M);CHR$141;CH
R$130;"MINEFIELD INSTRUCTIONS":NEXT
 1520 PRINT'TAB(5);CHR$134;"Z - LEFT"TA
B(25)"X - RIGHT"
 1530 PRINT'TAB(5);CHR$134;": - UP"TAB(2
5)"/ - DOWN"
 1540 PRINT'TAB(5);CHR$134;"H - HELP"
 1550 PROCspace
 1560 ENDPROC
 1570 DEFPROCspace
 1580 PRINT'TAB(8)"PRESS";CHR$136;"SPACE
";CHR$137;"TO CONTINUE";
 1590 REPEATUNTILGET=32
 1600 ENDPROC
```

WHO JUST BLEW IN FROM THE WINDY CITY, THEN?


IMAGIC
Sherlock Holmes
I KNOW YOU WON'T BELIEVE ME, BUT I HAVE JUST TRAVELED IN TIME!

Digitalised imaging features strongly in IMAGIC's new titles *Another Bow* and *The Time Machine*; for IBM pc and pc jr., Apple II range, CBM 64, and Atari.

commodore plus/4

COMMODORE's new top-of-the-small-range Plus Four. Nothing to do with golf — it's aimed at the small business user.

And what was RICHARD BURTON doing in Chicago in the first place? Why, checking out the mammoth Summer Consumer Electronics Show — when all that's new (and little that's not-so-new) camps out in McCormick Place for five days of computerfest. Here's his report.

DATELINE: CHICAGO. MY FEET are sore. Twenty-four hours ago I wasn't sure I had any feet left. Just two legacies of checking out the second largest computer show in the world — the *Summer Consumer Electronics Show* (the Winter CES held in Las Vegas is, I am told, a bit bigger).

They used to call this place 'The Windy City', not for the obvious reason, but because the politicians tended to talk at length about many useless things. There also used to be gangsters around the place a few decades ago. Now the only gangsters you'll see wear business suits and run restaurants.

Chicago can also claim a number of dubious 'firsts' in other areas: In no particular order: Wrigleys chewing gum, *Playboy* magazine and McDonalds all began life here. It is still the centre of the arcade video game manufacturing industry, a logical progression from the time when pinball machines were made (but banned from play) in the city.

Now a new sound hums from the town — the sound of electronic bleeps and bloops as microcircuits perform billions of functions in the half-blink of an eye. Each summer for the last six years the people who make the circuits hum gather together to show an astonished world what miracles they will be able to buy within the next few months. Not just computers but a whole array of electronic products from radios, TV and video to telephones and satellite earth stations.

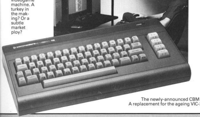
Last year the undoubted scene-stealer was Coleco's new *Adam Computer System*. On paper it looked too good to be true (and recent events seem to have proved this) but it was just the sort of Big Launch that the CES has made its reputation on. Would this year hold any more startling revelations?

On the surface it seems not. Of the major computer manufacturers only Atari and Commodore had new wares to announce.

Atari surprised critics and supporters alike by launching yet another video game system (their third), the *7800 ProSystem*. Starting out as purely a video game console that can accept nearly the entire range of VCS/2600 carts (as well as the new range of 7800 games), the *7800 ProSystem* can be expanded into a low-end 'beginner's' computer with the addition of a compatible keyboard. This operates with 4K of RAM, expandable to 20K and is said to have "word processing and BASIC capabilities". The 7800 appears in the U.S. in July with a price tag of around $150 and one game cart included. Later models will come with the *Pole Position II* video game built in. And yes, it will be coming to Britain some time before the end of the year — at least that's what they're saying now.

ATARI's Mindlink: still experimental, it utilises sensors to test for encephelographic waves (brainwaves) and also minute muscle flexing, translating these signals into code. A bit like biofeedback or a polygraph (lie-detector) machine.

Above: Against all expectations, ATARI launched the 7800 ProSystem dedicated videogame machine. A turkey in the making? Or a subtle market ploy?



The newly-announced CBM 16. A replacement for the ageing VIC-20?

Atari had two other tricks up its corporate sleeve. *MindLink* does away with those messy joysticks and actually puts your brain to work! The device consists of a soft-moulded headband linked to an infra-red controller. The headband detects slight electrical impulses generated by the muscle movements in a player's forehead and sends infra-red signals to the game console or home computer which control the on-screen objects. Special software will be needed for *MindLink* but all that was on display on Atari's CES stand was a form of old favourite, *Breakout*. As of writing I've yet to experience this Orwellian device first hand but the next issue of BIG K could contain some startling results.

Atari also announced their long-awaited collaboration with George Lucas' Lucasfilm Computer Division with two new games: *Ballblazer* (a sort of science fiction game of football) and *Rescue on Fractulas* (a simulation game that puts you in the driving seat of a planet-skimming craft). The games will be available in 5200, 7800 and Home Computer editions here before the end of the year.

Commodore finally put an end to the speculation about their next home micro. 264 or 364? Neither, actually. Prepare for the coming of the *Plus 4*. Now before all the jokes about baggy golfing trousers start coming, the *Plus 4* is so named because it has four items of software built in — the ubiquitous spreadsheet, word processor, database and graphics package that every business-orientated micro must have done these days. Which gives you an idea of the market the *Plus 4* is being aimed at. There are no plans for it to replace the *Commodore 64*. That is now seen as the 'flagship' of the Commodore line, with the newly announced *Commodore 16* filling in at the lower end (and surely replacing the ageing VIC-20) and the *Plus 4* at the top end.

Under all the business stuff on the *Plus 4* is a 64K RAM (60K available for BASIC programming) micro with a full travel keyboard. There are 8 reprorammable function keys, a Help key, screen 'window' facility, 128 colours, 320 x 200 pixel screen resolution, 2 tone generators and more. The *Plus 4* is compatible with the new *Commodore 16* but not with the *Commodore 64*.

As far as software goes it was very much Commodore's show, with the world, its wife and its 12-year-old whizz-brat turning to software for the *CBM 64*. Pretty much the only video game system left in the cartridge software stakes is the Colecovision.

Activision, Parker and Imagic had huge, expensive stands showing their rapid move into software for all major computer systems — notably the CBM 64.

Parker had *Star Wars The Arcade Game* running on most systems and a new starring role for its aquatic megastar *Frogger II: Three-deep*.

Zenji, Toy Bizarre and *The Activision Pencil* (a graphics aid) headed a strong line of new releases from Activision. Definite word at last on the first cassette-based releases for the Spectrum from Activision's International division: *Beamrider, H.E.R.O., Zenji, Space Shuttle, Enduro II, River Raid* and *Pitfall II*.

Activision also openly declared the interest in the new MSX system, which was noticeable at CES only by its absence. Dark reports of secret meetings with major manufacturers during the show abounded but hardly any machines could be seen on display.

Coleco announced boldly that it was standing behind its *Adam* computer and released a whole slew of new peripherals for it including a 5¼" disc drive and RS232 interface.

The British flag was waved proudly at the show by Sinclair Research and Quicksilva. The former had four dongled-up QLs on show (and which four people in Britain are still waiting for their machines?) and the latter's U.S. operation (somewhat surprised at the recent takeover) had a small stand displaying both its and Virgin Games' products.

To sum up: Chicago is a big city and the Consumer Electronics Show is an incredibly big show. As of writing it isn't over for me just yet. There's more to see and more to do. Join me again in the windy city next issue.

K = Could Be Better
KK = Could Be Worse
KKK = Unsurpassable

PICK OF THE MONTH/BIG K ZEROES IN

AVIATOR

by ACORNSOFT

ACORNSOFT GAMES
DISC
Aviator
for the BBC Microcomputer Model B

O.K., Me109s, COME AND GET IT

With their Battle of Britain vintage Spitfire flight simulator, Acornsoft have set new standards in this rapidly-growing sub-genre. KIM ALDIS explains why.

THERE'S A fair number of flight simulators around now for the BBC and other smallish micros — and for the most part they'd have trouble simulating Grandma making a cup of tea. Let's face it, a straight line and a rectangle with dots on it isn't exactly state of the art. The outlook was pretty bleak until Acornsoft entered the scene and with characteristic Battle of Britain panache dumped *Aviator* in our laps.

It's quite something. First time up I was airsick. Then I crashed a lot, which is to be expected. It takes a couple of years to get the hang of walking, so flying is bound to turn up the odd problem here and there, but then that's half the fun.

The 'plane in question is a Spitfire Mk II, in full detail. Anything a real Spitfire can do so can *Aviator*. Barrel rolls, looping, hedge-hopping . . . the works. Try raising the undercarriage before taking off and the landscape lurches dramatically as the dead ship flops its belly onto the ground.

It's all in pseudo-vector graphics (that's line drawings to you and me), but the competition pales in comparison. The difference between *Aviator* and the rest is the landscape — fields and trees, a river with a bridge under it and even a town called — what else — Acornsville. Points are awarded for flying under the bridge or through Acornsville. Double points if you're crazy enough to try it upside down.

Then there's The Theme, a touch of real class. Aliens(?) shaped like door wedges sit in the fields hoovering up the harvest and after bolting back half a field or so they grow wings and head for Acornsville where they make a start on the local population.

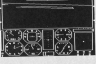
In the early stages the trick is to hedge-hop until you get fairly close and then lean on the fire button and plant a burst of cannon fire between their teeth. They kick up a fair amount of turbulance, though, so don't get too close.

After a bit the fuel starts to run low, but that's no problem. Just set down on the runway and nip off for a bite of breakfast while the Spitfire refuels. Once you get the hang of it you could probably keep going for a week.

This is an exceptional piece of work; nothing that I've seen for the BBC comes anywhere near it. It's a little pricier than the rest of the Acornsoft games — but don't be put off: you'll probably get more out of it than any other game you buy. — **K.A.**

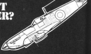
Game: AVIATOR
Maker: ACORNSOFT
Machine: BBC MODEL B
Format: cassette or disc
Price: £14.95 (cassette) £17.65 (disc)
Rating: KKK

QUOTE (from Air Vice-Marshal "Sandy" Johnstone, former commander of 202 Squadron, R.A.F.): *"I think it's absolutely marvellous. Anyone who can fly Aviator is well on the way to being able to fly the real thing. Mind you, I kept crashing . . ."*



YES, BUT IS IT A HUN KILLER?

TONY TYLER compares Acornsoft's Spit II to the real thing.



QUOTE (from program author Geoffrey Crammond, former Marconi systems engineer): *"A great deal of research on the Spitfire and its aerodynamics went into the game. Then it was simply a matter of storing points for the landscape and using 3D matrix transformations to manipulate them."*

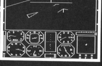
THE SPITFIRE Mk II on which the Acornsoft *Aviator* game is based was by and large the machine actually in service at the time of the Battle of Britain. It differed from the earlier Mk I in having a three-bladed propeller and as a result slightly enhanced speed. Its armament — here the Acornsoft version does not correspond to the original — was the famous set of eight .303 Brownings (*not* two wing-mounted cannons — these only came in with the 1941 Mk V).

In reproducing the flying characteristics of the Spit Acorn have gone further down the reality road than any other flight sim known to Big K — with the honourable exception of Microsoft's *Flight Simulator* for the IBM PC and clones. In order to keep the memory reserves high and avoid the problem of high-speed continuous fills (as the horizon tilts, so does a new solid map need to be filled), they have stuck to one colour and ignored solids altogether. This reduces the horizon problem to single line proportions.

The best thing about *Aviator* is the instrumentation. None of your crummy digital readouts, but proper dials that can be read at a glance. Everything has been thought of — failure to raise the undercart will hold the speed and the nose down and make the machine pitch uncontrollably. Takeoff speed seems a little high, and I'm not sure whether a fully-fuelled Spit unsticks quicker than an empty one (as it should and did).

Top speed in level flight of the original was around 323 mph — in a dive it was anybody's guess up to and exceeding 450. So it is here (nearly), with the entirely realistic provision that if you pull out too rapidly your wings fall off. The same dangers lie in wait for all overenthusiastic aerobats.

At the end of the day flight simulators are just that: simulators. At least half the dangerous manoeuvres your eye alone can warn you of in *Aviator* would — in the real thing — be detected and avoided by the famous "seat of the pants" feeling — i.e. if your stomach doesn't like it, then neither will the airframe. But until Acorn or some other entrepreneurs (probably Torch) conceive a way of putting you and your Beeb in a stilt-mounted, hydraulically operated, oil-smelling, exceedingly noisy box (with eight .303 Brownings) this will probably remain the state of the art.



Reviewers
STEVE KEATON
NICKY XIKLUNA
TREVOR SPALL
KIM ALDIS
TONY TYLER
RICHARD BURTON
RICHARD COOK

YODELLING

He's certainly getting around, this Horace character. First time around he was feeding his face in a maze. Now he's off to the Alps for a spot of skiing. Where are we going to see him next? Wallaby hunting Down Under, maybe?

Anyway, back to the business in hand. Horace, before he hits the slope, has to buy his skis. They're in a hut on the other side of a busy road and they cost ten dollars — Horace starts off with forty. If he gets knocked down an ambulance comes and takes him away, but only if he can pay a ten dollar ambulance fee. Would they really leave him lying in a pool of blood in the road if he couldn't pay? (Too true they would.)

Then comes the skiing bit. Horace has to be guided down the Hannekon run avoiding the flags, trees and any other garbage left lying around until he gets to the finishing post, then he gets another slope.

One would think a visit to the ski slopes with Horace would be quite exciting. On the contrary it's rather dull. All it really means is guiding a blob around a vast expense of white trying to miss things that get in the way. Perhaps the Dynamic Diggers could find him something more exciting next time around. — **K.A.**

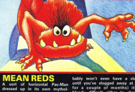
Game: HORACE GOES SKIING
Maker: MELBOURNE HOUSE
Machine: COMMODORE 64
Format: cassette
Price: £5.95
Rating: K

AD ASTRA
GARGOYLE GAMES

DEEP SPACE

Frantic interstellar shoot 'em up distinguished by some superb large scale cartoon graphics. *Ad Astra*, or, 'To The Stars' is the dashing motto of the Deep Space Patrol, and as a new recuit it's your dubious honour to patrol the shipping lanes between the distant Way Stations that mark the borderlines of Terran space. Needless to say these shipping lanes literally crawl with hostile Xtros. There's the Pirate battle cruisers and their speedy droid scouts to contend with, the mammoth minelayers of Mongo (or whatever) and interminable clouds of lethal space debris to avoid. It's a good job there's a joysticks option as my digits just couldn't take the pace. Space debris precedes each wave. Huge cratered globes spin towards you with dazzling smoothness. You can only hold your breath and dodge as they fly past — only to rocket straight into the eager maw of the alien force. The animation throughout is superb and I was particularly impressed by the mammoth minelayers. (Even if they caught me every time.) Still it's almost worth it for the megablast that ensues. I've yet to make a Way Station but I'm sure that when I get there it'll look grand. Of course such animation has its price. The action takes place over a static background and to sparse musical accompaniment. Still it's cheap for what you get. Space Cadets should enlist immediately! — S.K.

Game: AD ASTRA
Maker: GARGOYLE GAMES
Machine: SPECTRUM 48K
Format: cassette
Price: £5.95
Rating: KKK



MEAN REDS

A sort of horizontal Pac-Man dressed up in its own mythology: you're a member of the great starfaring race of Intergalactic Cheese-snufflers, marooned in a maze beyond the furthest reaches of space and time . . . that sort of thing.

Basically, you're in a Pac-Man style labyrinth, gobbling up the old dots on the ground and occasionally chancing upon a special one that allows you a limited time to gobble up the Red Meanies that are chasing you. But whereas in *Pac-Man* you're looking down on the maze, here you peer along its corridors. Nice for the hurtling effect as you hit a long stretch. Horrible when a Red Meanie suddenly looms, enormous, up in front of you. As you can't tell where you're going (and probably won't even have a clue until you've slogged away at it for a couple of months) it's bloody difficult either to chase said red things or even deduce where they are in relation to you when you hear the warning beep that indicates a hostile prescence nearby. Oh yeah, there are also things called Blue Loonies that also loom up, set off the alarm etc, but they're perfectly harmless and are presumably only there to give the novice a nasty turn.

In all, a novel variation on a classic theme, but not quite novel enough to make it a big success. — **D.R.**

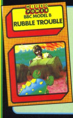
Game: RED MEANIES
Maker: SALAMANDER
Machine: DRAGON 32
Format: cassette
Price: £7.95
Rating: KK

Spectrum
TRON

TROMS MEET MORT

Cripes! This is absolutely bad, man. Imagine *Tron* without effects. Tom without Jerry and *Gridrunner* without grids. Imagine being sentenced to life in an arena of relentless peril, illuminated only by the flames from a central inferno and the flash of laser fire. Imagine heavy duty warfare. Imagine there's no people . . . About the screen sparkle The Bits. With your trusty Bitsearcher (fashioned after the battle cruiser from Tron, hence the awkward title) you must hoover 'em up one by one and deposit them into the central furnace. Sharing the arena are the Bytesheets, great walls of noise that grind up and down the screen, and around the edge skate the deadly Nibbles who pump poisonous pixels stage centre. All must be avoided. As you move through the screens the Bytesheets become more furious and the Pixel shower more intense. Its a visual nightmare that requires fearsome coordination. A simple idea true enough, but the game just won't quit. Like I said: It's bad, man. — S.K.

Game: TROM
Maker: DK'TRONICS
Machine: SPECTRUM 48K
Format: cassette
Price: £5.95
Rating: KKK



PROGRAMMER ON THE RUN

This is another variation on the old sliding block game, but with a sting in the tail. You know the kind of thing, shove rocks around the screen trying to flatten beasties. Trouble is if you miss the beasty the rock bounces off the first thing it comes across and gives you a nasty slap in the gob. Not a pretty sight. Course you can dodge out of the way.

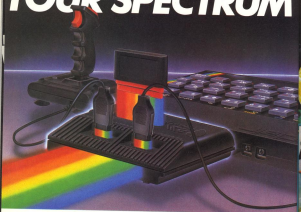
Confused? Let uncle explain. The year is 2003, the setting the aftermath of a nuclear holocaust in a maze of rocks, where the sole survivors are Krackats (who dreams up these names?) These little nasties have developed a taste for human flesh (flesh'n'chips?), so the idea is to give them a good pounding with a rock. But I like I said, watch out for the rebound, it's a killer.

Then there's the other screens. The first is fairly straightforward, sort of what you see is what you get. But the second and third are something else. Number two is the 'Hayfield' where the whole screen is filled with rocks. You have to guess which ones are real. Then come the hidden rocks. Finding a way around a maze you can't find presents certain problems. Need I elaborate?

Rubble Trouble is good, probably the best I've seen for the BBC. Well worth an investment. — **K.A.**

Game: RUBBLE TROUBLE
Maker: MICRO POWER
Machine: BBC MODEL B
Format: cassette
Price: £7.95
Rating: KK

TURBO CHARGE YOUR SPECTRUM



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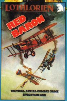
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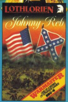
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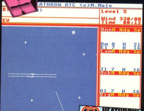


Roger, Golf Zulu Turn left…er…

First thing that happens is you crash a lot of aircraft and kill a lot of people. Sounds good, huh? Well all you aspiring homicidal maniacs out there better think again. The object of the exercise is to land the aircraft safely and NOT kill the people. Of course if you've got a real vicious streak you can have great fun directing all the traffic to the middle of the screen then sit back and watch the resulting carnage. That's if you can get the hang of it first. Believe me, it ain't easy.

Heathrow is a simulator. Not a flight simulator, but an air traffic control simulator. First there's the instructions to plough through. Complicated? Imagine a four year old learning machine code.

The game takes you through seven levels, from total none-brain air traffic controller to super ultra zippo air traffic controller, with a demonstration somewhere in the middle. When you start getting competent (maybe three years from now) you can start covering things like Vortex Spacing (Eh?), and emergency procedures. this is a faithful simulation of the problems facing an air traffic controller and it would come as no surprise to learn that there's a room full of nervous wrecks somewhere in Heathrow with a label on the door, 'Ex-air traffic controllers'. **—K.A.**

Game: HEATHROW AIR TRAFFIC CONTROL
Maker: HEWSON CONSULTANTS
Machine: BBC MODEL B, ELECTRON, SPECTRUM 48K
Format: cassette
Price: £7.95
Rating: KK

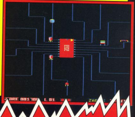
HEATHROW
AIR TRAFFIC CONTROL
HEWSON CONSULTANTS

TRANSISTORS REVENGE

Game: TRANSISTORS REVENGE
Maker: SOFTSPOT
Machine: BBC MODEL B
Format: cassette
Price: £6.95
Rating: KK

'Your computer is revolting' I was informed by the instructions. I was offended. Dog-ends apart, it seemed clean enough. Reading on, things became clearer. It seems that there's a massive power struggle going on inside the computer. The CPU has been abusing its position of power and the lesser components are rebelling. they come steaming down the circuit tracks with malicious intent. You move a fire pointer from pin to pin giving the unruly components the old one-two before they get too close. If they reach the chip it's Zapsville. As time goes by word gets round that there's a shoot-out at the O.K. 6502. You get bombarded by more and faster components and the going gets pretty tough. In later pages the circuit tracks form more complicated shapes and you've got your work cut out just trying to see where they come from.

Transistors Revenge is fast and furious. Nice, smooth presentation and enough action to keep you permanently on your toes. If you imagine *Space Invaders* tied in a few knots and then shoved into a tumble drier you'll have a pretty fair idea of what's going on. **—K.A.**



FIREBALL FURIOSO FOOLISHNESS

K-tel COMMODORE 64
CITYATTAK

Cityattack is hot stuff. Its full panaorama lies across several screens, and the graphics are smooth and classy. Panning from left to right we have "Mission Control" — a looming launch-pad-cum-official building. Then there's Everytown's "Roxie" cinema; a City Hall replete with statue: and, of course, an Arcade. Yes, folks, all's calm in Cutesville until a warning sounds — "The Invaders are coming!" Time to sail the screens and once more a-blagging go.

Now, if you're going to exhale a super-silly-ass sigh and presume that this is just another invaders clone — you're very wrong, pal. There's lotsa surprises in store. First lesson: oply the foolhardy will attempt to attack these invaders from the front. Sneak past them at ground level — initially mandatory attack pattern — and get 'em from the rear. Then, just as you get stuck into Saving the City, a dirty great multicoloured fire-ball appears and spits its path across the screen. (I could tell you how to conquer the fire-ball — but I won't. Aha!) Then there are sudden ground attacks from the odd squad, which are heralded by a bizarre scampering noise.

Talking of sound, that's also used creatively on this game. I don't just mean that the fire-ball really sounds like it's burning, but the game is kind of rhythmic. It all adds to the excitement of the game.

There are 14 levels of play, though only superheroes, crooks and liars have got through them all to discover . . . Hey presto! It's back to square one! There's enough meat to keep you trying! A truly intelligent piece of programming. **—N.X.**

Game: CITYATTAK
Maker: K-TEL
Machine: COMMODORE 64
Format: cassette
Price: £6.95
Rating: KKK

K = Could Be Better
KK = Could Be Worse
KKK = Unsurpassable

COMMODORE 64
RED ALERT

CHIPS FOR EVERYTHING

Two strategy games from the same stable, one drearily mathematical, one moderately exciting. The 64 isn't a very good micro for strategic pastimes — how to put the graphic capabilities to use? — but *Red Alert* at least uses what it can in pictorial terms.

One to four users can tussle to raise capital, hire underworld stooges, evade police snoopers and gather up useful trifles like flamethrowers for, eventually, an assault on a missile base (a rocket is launched as the glorious climax of the affair). In fact, the nub of the game is raising loot, done mostly at a casino fruit machine or a perverted card table which the computer usually wins at. The rest is played out like a series of episodes from low budget espionage movies: mysterious assignations at Clapham Junction, trips to Moscow (huh?) and harrassment by the feds which results in many a bundle of secret papers disappearing down a lavatory bowl. A cynical assessment would be 'gambling game with knobs on', but it's engaging enough in a modest way.

Wheeler Dealer is an unfortunate stiff from screen one. Up to 16 can play (when was the last time you had 16 crowded round your micro?) at a pointless scenario where gearboxes, tyres, engines, monopolies, bank balances, industry troubles and general inertia jostle politely for attention. The graphics are of ZX81 standard, the 'action' wouldn't leave a tortoise breathless and the most pressing issue isn't staying in business, it's staying awake. Avoid. — **R.C.**

Game: WHEELER DEALER
Maker: MR CHIP
Machine: COMMODORE 64
Format: cassette
Price: £5.50
Rating: None

Game: RED ALERT
Maker: MR CHIP
Machine: COMMODORE 64
Format: cassette
Price: £5.50
Rating: K

HIM TOOK HIM CHANCES MEK HIM MONEY — SEEN?

They're a witty lot, Task Set — this one is subtitled 'Super Digital Mix'. I couldn't recognise the tunes Rankin' Rodney skanks around the screen to but it's a merry enough accompaniment to his misadventures. A joystick pilots him from the centre of each of 20 screen, onto multicoloured conveyor belts and from there into four sectors which each house a particular instrument (a change in the tune comes when Rodney picks one of them up). Once he's got all four back to the centre — having dodged lethal crotchets and patches of discord — it's on to the next screen.

Personally, my peepers were feeling frazzled after 20 minutes: the key to hopping the moving belts is getting on to the right colour dots, and the display is ablaze with fluorescence. RR isn't a very clear piece of animation and sometimes the fellow is almost invisible — besides which the controls don't seem too responsive in shifting him. Never got beyond the first few screens so I can't tell if there's any drastic change later on, though I will say that this is much harder than TS's other newie, *Super Pipeline*. Very lively, but I & I will have to practice like roots man to be top dread, seen? — **R.C.**

TASK SET!
THE BUG STOPS HERE!
JAMMIN'
SPECIA

Game: JAMMIN'
Maker: TASK SET
Machine: COMMODORE 64
Format: cassette
Price: £6.90
Rating: K

76 JELLY TOTS LED THE BIG PARADE

K-tel COMMODORE 64
ODYSSEY

In the first game I got three lives. The second very generously coughed up seven without giving any real indication of why. Such minor inconsistencies aside the game was good. Don't think — just shoot: fast and from the hip. Move slower than a cat with its tail on fire and you're dead. Don't even worry about where, you'll hit something.

*The first screen is a variation on*Space Invaders*. Weird but definitely menacing objects with an uncanny resemblance to Jelly Tots parade across the top of the screen dropping bombs. A 'Robo Crab' patrols the bottom half of the screen. When Guardian Pests start to form a pincer movement from the side desparation turns to sheer panic.*

Clear screen one and the scene changes. An egg wanders around the screen with four Robo Crabs circling it. You need five consecutive hits on the egg without being hit by a stun bomb. Not easy. Just when you're getting a taste for blood, probably green, you notice that your score is falling fast. Panic rises proportionally.

Odyssey seems to be a cassette full of just about every alien-zapping game known to man and alien alike. there are five screens, each one vastly different from the rest. I must confess to being confused about how many lvies I had. Sometimes it was three and in other games I counted as many as seven, but in spite of this it definitely works. I only hope I can explain away all these dead aliens to the cleaners. — K.A.

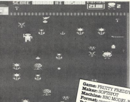
Game: ODYSSEY
Maker: K-TEL
Machine: COMMODORE 64
Format: cassette
Price: £6.95
Rating: KK

NICK THE FRUIT. AVOID THE SPARROW.

Honesty is the best policy, or that's what they teach in the Boy Scouts. Fruity Freddy wasn't in the Boy Scouts. A quick butchers over the fence for the all clear and it's straight into Mr Meano's garden after the fruit. We all know that scrumping is a risky business but Mr Meano's garden is like cuddling sharks. First of all there's the killer bees swarming out of the bee-hive, then the Crazy Crimson Catapillar zips across the garden trying to make dead Freddies. Tread on a seed before it's fully grown and Mr Meano storms out of his house throwing mega-wobblies fit to bust.

Then there's the sparrow. Since there's no way to be discreet about this let's be blunt. It dumps on Freddy. To you and I a sparrow dump means a mild case of embarrassment and an urgent need of a handkerchief, but as far as Freddy's concerned it might as well be an elephant. He staggers about in a daze and then drops dead.

All in all Freddy does a lot of dying. It's a challenging game and once you get the hang of it it's great fun. — **K.A.**



Game: FRUITY FREDDY
Maker: SOFTSPOT
Machine: BBC MODEL B
Format: cassette
Price: £6.95
Rating: KK

K = Could Be Better
KK = Could Be Worse
KKK = Unsurpassable

YO! HO! HO!

So there was I, sailing the high seas, splicing the odd mainbrace and shivering a timber here and there, when up walks Long John Silver with a real neato plan with a pretty heavy cash return.

This is a fairly standard adventure game but what gives it a good position in the Adventure Game Hall of Fame is its wit and a clever use of sound. The cassette loading is accompanied by a sea shanty which is retained for later use in the game. As you approach the seashore you hear the sound of surf and seagulls (they really do sound like seagulls). Limited but clever use is made of the Mode 7 graphics and the description of locations is interesting. A major frustration with some adventure games is the same old response when you pick up an object or give the computer an instruction it can't understand. Not with Flint's Gold. It has a library of interesting responses.

While it couldn't hold a place with the world's adventure classics, it could well find a secure position in the games cupboard. **— K.A.**

Game: FLINT'S GOLD
Maker: MICROGRAPH
Machine: BBC MODEL B
Format: cassette/disc
Price: £6.95 (cassette)
£6.95 (disc)
Rating: KK

But Where is Wayne Fontana?

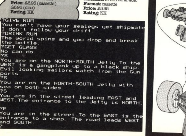
Adventure fan Paul Styles wrote this puzzler with the Quill, and Gilsoft were so impressed that they marketed it! Being a 'fan' rather than a 'professional' author, perhaps Paul has kept his tongue firmly planted in his cheek as this adventure's descriptions and responses show a splendid sense of humour.

It all started in the office where I spend my "ordinary humdrum existence", furnished with just a telephone, a desk diary and (Aha!) a quill pen. Suddenly the phone rang! I answered the insistent purr to a listing voice which declared (à la Max Boyce) "Croeso y Cymru". The room span, my world vanished . . . and I recovered consciousness inside a closed cell in the huge complex of Mindbender. Alone, unarmed, I had to seek out and destroy the terrible threat.

Paul has ignored some of the Quill's visual presentation (viz. highlighted directions and objects) in favour of the plainer Artic-style, and made singular but effective use of sound.

Not the most difficult of adventures so far, but an excellent introduction for novice adventurers: even seasoned veterans should find enough to keep them entertained. Anyway, I must get back to the kitchens and that food . . . **— T.S.**

Game: MINDBENDER
Maker: GILSOFT
Machine: SPECTRUM 48K
Format: cassette
Price: £5.95
Rating: KK



```
?GIVE RUM
You can't have your sealegs yet shipmate
I don't follow your drift.
?DRINK RUM
The world spins and you drop and break
the bottle.
?GET GLASS
No can do.
?S
You are on the NORTH-SOUTH Jetty.To the
WEST is a gangplank up to a black ship.
Evil looking sailors watch from the Gun
ports.
?S
You are on the NORTH-SOUTH Jetty with
sea on both sides.
?S
You are in the street leading EAST and
WEST.The entrance to the Jetty is NORTH.

?E
You are in the street.To the EAST is the
entrance to a shop. The road leads WEST
and SOUTH.
?
```

CUSPINS COUSINS

Time to don the lycra cat-suit of your choice and rescue the world again! This time the wotton beastly devils have besieged the very Zodiac itself (egad!) And scattered all of the beastly signs willy-nilly in a maze.

So, superhero (mug), it's all up to you to travel the tortuous maze, scupper the caddish demons within, bag the signs of the Zodiac and bring 'em all back home. Jolly good show, what?

A great quasi-adventure game. The action is smooth, and the graphics simple and effective. Once you've marched your sign-seeking doppelganger through every nook and cranny of the maze, you can begin to make grand martial plans about the best possible route to take. As you progress, the demons multiply (wouldn't ya just know it?) When you've collected all twelve signs, they reappear in the final screen. It becomes your task to pick 'em up and guide 'em into the central chamber. Sadly, 'tis at this point that I get snuffed. Hence I cannot recount an ending — but my guess is that you'll have a lot of fun finding out. Go to it! **— N.X.**

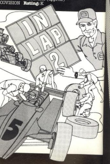
Game: ZODIAC
Maker: ANIROG
Machine: COMMODORE 64
Format: cassette
Price: £7.95
Rating: KK

Quite, Henderson — the spare wheel!

EPYX ARE deservedly well-known in the US for a series of superb action adventures and strategy games, mainly targeted on Apple and Atari to date. Pit Stop represents their plunge into Coleco-land.

If they hope to compete with Coleco's own Turbo Driver *— let alone the peerless and as yet unsurpassed* Pole Position *— they've got another think coming. The actual race-car sequences are less detailed and less convincing, while the Pit Stop routine — on which Epyx have pinned their hopes in a desire to find a new lick — rapidly grows tedious. You can win or lose a race in the pits, sure; you can also blow it with an ill-judged ROM that adds nothing to what already exists on the market. Coleco and Atari can sleep tight.* **— T.T.**

Game: PIT STOP
Maker: EPYX
Machine: COLECOVISION
Format: ROM
Price: £29 (approx)
Rating: K



Threesome

Back to the control seats boys — it's time to save the universe again. This time it's Triads and they are MEAN. Swooping in from the distance blazing death they grow larger and more menacing until they nearly fill the screen.

Once they're mopped up there's an asteroid storm to contend with. This has to be cleared before the transport fleet can pass through to its destination planet. Success is rewarded with promotion through the ranks, failure means a visit to that Great Space Station in the sky.

After a brief respite, barely enough time to grab a cup of synthi-caf, another fleet of Triads has to be dealt with.

The great thing about this game is the added features. Turning off the sound, Freeze Game are all there, plus several others. I liked the option of playing against more than one player, it saved a multitude of family arguments. But for real kicks try turning off the gun sights. — **K.A.**

Game: TRIAD
Maker: LIVE WIRE
Machine: COMMODORE 64
Format: cassette
Price: £8.95
Rating: KK

SPACE SHUTTLE

Microdeal are a Cornish company rightly famed for carefully researching their market. Research told them that their *Space Shuttle* game, at that time already out in BBC and Dragon versions, could stand a little spreading across the board; which is why it now appears on Atari.

In a sense the game's designer has been handicapped by a praiseworthy desire to effect a genuine simulation. This means the velocity parameters, for example, are necessarily inflexible. Perception of these from the pilot's point of view (the p.o.v. you get) is necessarily slow. So even the smoothest code wouldn't be able to cope with the problems posed by lack of high-enough resolution: even single pixel movement, if slowed down enough, can and will be jerky.

That said, instruments faithfully record your progress; and through the window you see stars, floating satellites, etc — but all the same a bit of showbiz would have been welcome. In a word (and this is an odd criticism to make of a sim), too much data fidelity and not enough pizazz.

Space Shuttle comes in the usual Microdeal cryogenic packing with the naff artwork. Two versions — 16K first and then a 32K version — follow each other, which is thoughtful considering Ataris also break down along these very lines. Fans of faithfulness will go for it; me, I found it a little on the dull side — but then, I imagine the real things must have its moments of *ennui* also. — **T.T.**

Game: SPACE SHUTTLE
Maker: MICRODEAL
Machine: ATARI 400/800XL
Format: cassette
Price: £8.00
Rating: K

THE KLARTZ COUNCIL

THIS IS an adventure game for the novice and experienced alike. Being a 'multi-adventure' you do not experience the mind-numbing problem of coming to a dead halt at your first apparently insurmountable obstacle. Merely leap into your handy Time Capsule and zoom off elsewhere. There are five 'elsewheres' for you to zoom off to so there is plenty to do on a first play.

Initially this is a mapping and maze-solving task which will teach the beginner some important principles of adventuring. Response is quite good and the vocabulary adequate. Just when you think everything seems straightforward this text-only adventure throws up some real challenges. Identifying and collecting objects present few problems (there are some random elements which require time-wasting perseverence) but entering locations can present a few.

The program can be unforgiving to the unwary. Having got stuck in a shaft where it is too dark to see and movement impossible I didn't even get given the option of starting from scratch. I gave up, pressed reset . . . and found I'd lost the program. To make a blunder and then have to reload does not encourage 'adventurous' play. By all means kill me off but having to reload the whole game . . . tut, tut!

All in all, definitely a game to return to and try again and again. Some descriptions seem 'sloppy' but this adventure is much better than many. There is a lasting impression that it has hidden depths . . . will someone tell me how I can get a light so that I can see them? — **T.S.**

Game: KLARTZ & THE DARK FORCES
Maker: DRAGON DUNGEON
Machine: DRAGON 32
Format: cassette
Price: £9.95
Rating: KK

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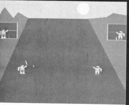
ALL THAT GLITTERS IS GOLD!

I collapsed upon Zalaga parched and rigid. Severely depleted after hours of fruitless bafflement at the keys of Derek Brewster's mega-headache Codename Mat *(for the Spectrum from Micromega), I could barely muster the enthusiasm to breathe. The end, I felt sure, was both near and growing steadily impatient.*

Then I loaded Zalaga . . . and suddenly all was right with the world again. It was as if a litre of easy-scoop had been crammed down my shorts. My digits were dancing.

Zalaga, it transpires, is the perfect antidote to hyper complex, smart-ass super progs. It's that antithesis of the current vogue: Galaxians. *Not any old Galaxians — but the BEST Galaxians. The thing is magic! Ferociously difficult, refreshingly accessible, beautifully drawn and thoroughly addictive. Wave after wave of waltzing war birds whizz toward you and there's no ineffectual pondering, no consternation at the keys. You just let those suckers fly.* — **S.K.**

Game: ZALAGA
Maker: AARDVARK SOFTWARE
Machine: BBC B
Format: cassette
Price: £6.90
Rating: KKK



HAVE A STAB AT THIS . . .

Take a trip back to the good old days when men were men and duels were fought in lonely valleys at the crack of dawn. The Holy Deutscritter Order of Teutonic Knights (say that fast three times) was based in Alsace in the twelfth century. They followed a strict code of honour — know the Lord's Prayer, have no personal possessions, avoid taking women etc. Sounds like the life of Reilly. Anyway, it seems that these noble men used to settle their differences by trundling off to a valley at daybreak and sticking swords into each other.

It's a two player game with two swordsmen who can be made to move around the valley and prod each other with swords. With the exception of the odd rather knock-kneed stance they look passably realistic. Control is available from either keyboard or joystick. Unless you've got rubber fingers use the joystick. — K.A.

Game: SWORD MASTER
Maker: ACORN USER
Machine: BBC MODEL B
Format: cassette/disc
Price: £7.95 cassette/£10.95 disc
Rating: KK

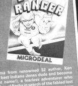
CAN'T DO THAT, GUV

Task Set have a brilliant slogan — *The Bug Stops Here!* — but the games I've seen from them so far don't quite match up to the suggested sharpness. *Super Pipelines* is a kind of externalised maze game: you control a burly overalled bloke who's a pipeline foreman (he marches onscreen to the strains of Laurel & Hardy's cuckoo song — not something to inspire confidence, methinks) and he trots genially around a serpentine pipe structure doggedly followed by one of his diminutive repairmen.

As oil courses through the pipe, nasties resembling carmine woodlice beetle up a ladder and pursue your men around the pipe, while a sinister hombre called the Ladderman sneaks up the same route and tries to plug the line. You blast them with an inexhastible handgun and try and save oil — once the fuel gauge reaches a set figure you're on to the next screen — while keeping an eye on the dreaded Lobster that sometimes crawls in from behind.

A droll undertaking, overscored with deafening music. The problem with the game is it suddenly gets too hard: the first three pipes are easy but from thereon it's damn near impassable. The screen display's dark backdrop makes the action lucid and bright, and I like the way you can set up your workmen's demise in order to save your own skin when cornered. Finally, though, more frustrating than fulfilling. — **R.C.**

Game: SUPER PIPELINE
Maker: TASK SET
Machine: COMMODORE 64
Format: cassette
Price: £6.90
Rating: KK



URNING YOUR POINTS

Totally fiendish huntarama from renowned 32 author, Ken Kalish. In it you don your best Indiana Jones duds and become the Danger Ranger (great name!), a fearless adventurer who must raid the dread chamber of Pasha in search of the fabled lost keys of the Covenant etc etc. These keys are located at various points of the chamber and are guarded by floating urns, flapping bats and blinking eyeballs. As is the way of things you have only a laser eraser for company. Having collected the keys you journey to the acid cavern where treasure chests rest in the arms of demons. If the meagre allowance of screens is generally frustrating the sheer difficulty they offer should tempt even the most spoilt explorer. The chamber of Pasha is a killer! The combined assault of both bats and urns defeated me every time. Only once did I stagger through into the caverns of acid where I was rewarded with nowt but a swift and humiliating end. Something which never happens to Harrison Ford! Beautifully illustrated and mind bogglingly tough this 'sticks only game is an absolute must for the serious Dragon hunter. Play it and weep. — S.K.

Game: DANGER RANGER
Maker: MICRODEAL
Machine: DRAGON 32
Format: cassette
Price: £8.00
Rating: KKK

DRAGON WORDS

Dragon users: are you cheesed off with your low density screen displays and prehistoric graphics facilities? Then listen up, as this useful multi-featured utility is a must for all those wishing to scrag their micro's gruesome text display. With a new user definable 224 character set featuring real lowercase, slimline cursor, slashed zeros (gasp) and a host of handy graphics characters this enhancer offers instant relief for frustrated hackers. It can be used in Basic and Machine Language programs with relative ease and offers up real options for eager authors. The ability to produce text and hi-res graphics I found particularly exciting. Some visually exciting Dragon adventures may well be on the cards at last! Word processing also becomes a lot more feasible. Its potential is huge. Although I have some doubts about the accompanying manual (too lightweight by half!) the demo program and help screen feature make the thing refreshingly accessible. Serious users will welcome it with open arms and novices might well be surprised when they get to fish around in it. — S.K.

Game: RAINBOW WRITER SCREEN ENHANCER
Maker: MICRODEAL
Machine: DRAGON 32/64
Format: cassette
Price: £19.95
Rating: KKK

EASY OVER

Infamous, nerve-jangling egg harvest originally released for the Spectrum and now made available for a range of popular micros. Surprisingly it's not Hobbit-like sophistication or state of the art graphics that has made it so popular. It's the sheer inaccessibility of the thing! It's been thoughtfully designed so that only the most dedicated gamester will make any headway into the later screens. Us passing players stand no chance. We can only throw up our hands and wail: "The lifts! The lifts! Eeearrghh!" What's worse the thing insists on bleating out the tune of 'The birdie song' as you go along. It's enough to make you climb off your trolley. Newcomers should be warned that the game's rep is well founded and consequently delicate types are advised to approach with extreme caution. — **S.K.**

Game: CHUCKIE EGG
Maker: A&F SOFTWARE
Machine: DRAGON 32, BBC B, ELECTRON, CBM64, 48K SPECTRUM
Format: cassette
Price: £7.90
Rating: KKK

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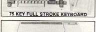

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If you're looking for real value in a computer system, one which can handle anything from serious Word Processing to enhanced Colecovision style video games such as Buck Rogers, look no further. The Coleco Adam is here with a package which will make you wonder if you're dreaming when we tell you about it. A price breakthrough in computer systems, Adam is comprised of an 80K RAM memory console with a built-in 256K digital data drive; a professional quality, stepped and sculptured 75 key full-stroke keyboard; a letter quality daisywheel printer and a full word processing program built into the Console. Two additional pieces of software, Smart BASIC and also 'Buck Rogers - Planet of Zoom' (the ultimate in advanced video games), are included as well as a blank digital data pack. Adam can be used with any domestic colour Television set.*

MEMORY CONSOLE/DATA DRIVE: *The heart of the Adam system is the 40K ROM and 64K RAM memory console which combines with the 32K ROM and 16K RAM in Colecovision to give you a total of 72K ROM (including 24K cartridge ROM) and 80K RAM (expandable to 144K). Built into the memory console is a digital data drive which accepts Adam's digital data packs, a fast and reliable mass storage medium that is capable of storing 256K of information, that's about 250 pages of double spaced text! The console is also designed to accomodate a second optional digital data drive.

FULL STROKE KEYBOARD: The Adam keyboard has been designed as a professional quality keyboard that combines ease of use with an impressive array of features. It is stepped and sculptured for maximum efficiency and has 75 full stroke keys which include 6 colour coded Smart Keys which are redefined for each new application; 10 command keys which are dedicated to the word processing function, and 5 cursor control keys for easy positioning of the cursor at any point on the screen. You can attach a Colecovision controller to the keyboard to function as a numeric keypad for easy data entry. It can also be held like a calculator, a feature which makes working with numbers particularly easy. The joystick part of the hand controller can be used in the same way as the cursor control keys, to move the cursor around the screen.

LETTER QUALITY PRINTER: The SmartWriter letter quality daisywheel printer is a bi-directional 80 column printer which prints at a rate of 120 words per minute. It uses standard interchangeable daisywheels, so a variety of typestyles are available. The printer has a 9.5 inch wide carriage for either single sheets or continuous fan fold paper and uses standard carbon ribbons. It is comparable to many printers which cost as much as the total Adam package. The printer can be used either with the Adam's SmartWriter word processing program or as a stand alone electronic typewriter.

BUILT-IN WORD PROCESSOR: Adam comes with SmartWriter word processing built-in. This program is so easy to use that you only have to turn the power on and the word processor is on line and ready to go. Detailed instruction books are not necessary as the Computer guides you step by step, working from a series of Menu commands. It enables you to type in text, then completely edit or revise it with the touch of a few keys. Changes are readily made and a series of queries from the computer confirm your intentions, so that you can continuously double check your work as you type.

COMPATIBILITY WITH COLECOVISION: By using high speed interactive microprocessors in each of the modules, the Coleco Adam is designed to take additional advantage of both the 32K ROM and 16K RAM memory capability in the Colecovision. If you do not already own a Colecovision Console (£99 inc VAT), then you will need to purchase this when you initially purchase your Adam Computer package (£499 inc VAT), making a total purchase price of (£598 inc VAT).

WHAT IS COLECOVISION: Colecovision is one of the worlds most powerful video game systems, capable of displaying arcade quality colour graphics of incredible quality on a standard Colour TV set. The console (see picture bottom left) accepts 24K ROM cartridges such as Turbo and Zaxxon and is supplied with the popular Donkey Kong cartridge and a pair of joystick controllers. Colecovision has a range of licenced arcade hits available such as: Gorf, Carnival, Cosmic Avenger, Mouse Trap, Ladybug, Venture, Smurf, Pepper II, Space Panic, Looping, Space Fury, Mr Do, Time Pilot, Wizard of Wor and many others. So there you have it, Adam plus Colecovision the unbeatable combination. Send the coupon below for your FREE copy of our 12 page Colour brochure giving details on the complete Adam system.

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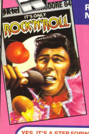


ROCK 'N' ROLL WILL NEVER DIE (WRONG!)

So ya wanna be a rock star? Step right this way, but be careful. The music biz is full of sharks and the public is fickle.

A while ago K-tel came up with a game, on Spectrum, which gives you the opportunity of stardom. Now it's on CBM-64 — a wise move.

The game takes the form of multiple choice questions on the action you might wish to take. Options like going on a tour, choosing a manager, etc. are presented on the screen and you have to decide on the best course of action for your group.

If you decide to write a song the computer takes on the task for you. It has to be said that computers are not great composers. Lines like "Do you want a wimp, dooh wop a bop dooh" are hardly Lennon & McCartney stuff.

Playing a concert or going on a tour gives you the chance to view highlights with music. Again the aural battering that can result is likely to make you go into retirement but as I said, computers lack imagination in a big way. — **K.A.**

Game: IT'S ONLY ROCK'N'ROLL
Maker: K-TEL
Machine: COMMODORE 64
Format: cassette
Price: £6.95
Rating: K

SHORT-ARSE

This is the first adventure I've seen that compares even in the slightest with a Dungeons and Dragons session.

Obviously written by a fan of *Gygax*, it's all about this nasty dwarf, Arfa (ah-ha), who's nicked some of the local king's jewels. Understandably, the king is less than chuffed, and proceeds to hire the local hero (ah-ha) to get after the miniature miscreant.

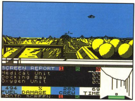
Like most adventures, it's kept to the traditional mould . . . jewels, heroes, kings, etc. The input parser is better than adequate, allowing more than two-word orders.

The packaging is real neat; a little pamphlet comes with it full of nice piccies and scene-setters.

Cleverly constructed (and fairly long), my only moan is that it's too easy to crook. — A.G.

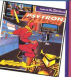
YES, IT'S A STEP FORWARD

A slick, complex and damnably difficult turnaround in which you, dear hacker, become the computer. Become the mighty Psytron computer, that is, the system in sole charge of the vast and intricate Betula 5 installation. You remain ever vigilant for intruders, of which, needless to say, there are many. You pursue flying saucers across a panorama of ten screens, chase inset-like alien saboteurs along narrow tunnels, trying to hit them before they knock off an airlock or blow a hole in the pleasure dome or something. When they do cause damage, you have to assess it, allocate resources to effect repairs and generally juggle supplies to keep the whole place going.

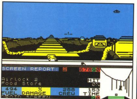


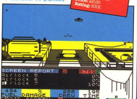
As I said, damnably difficult. So difficult that if you manage to keep the place going for over an hour at the final level, you stand to win yourself a QL. To do that, you have to know the thing inside out, match the strategy of a military tactician with the coordination of a concert pianist and probably have a fair bit of luck as well. For myself, despite much beavering away into the night, I've only managed to master Level 1 (chasing the saboteurs). Popping off the saucers before they zap the power plant or knock out the fuel dump (Level 2) is, as yet, beyond me.

All of which, I suppose, augurs well. Psytron is certainly not the kind of game you master, exhaust and discard in a couple of afternoons. It's graphically superb, nicely-priced and does seem to match Beyond's claim to provide "challenging software". My only quibble is that the initial training levels could be a bit more encouraging. But then, I'm lazy. — **D.R.**



Game: PSYTRON
Maker: BEYOND
Machine: SPECTRUM 48
Format: cassette
Price: £6.95
Rating: KKK





K = Could Be Better
KK = Could Be Worse
KKK = Unsurpassable

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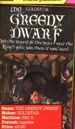

THE GOLDSTAR
GREEDY DWARF
Only the bravest of the brave wear the King's gold; join them if you dare!

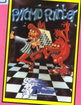
Game: THE GREEDY DWARF
Maker: GOLDSTAR
Machine: BBC B
Format: cassette
Price: £9.95
Rating: KK

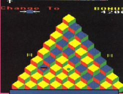
Cheops Meets Dulux

Hah! You don't fool me. This is *Q-Bert*. Rather a crude Bert at that. Colour plays something of an active part here. Fact is it lights up the room like a disco and without sunglasses leaves you partially blind. *Q-Bert* has fallen in love with the beautiful Princess Aran from Tapen. Before being given access to the hand of said lovely lady he must complete a task set for him by her father, King Eg. This task is the painting of the Great Pyramid of Vali. So you guessed already, huh? Of course there's the inevitable bouncing ball, bouncing from the top of the pyramid, more than capable of pancaking Bert like a frog in the road, and the Thin Man instead of a snake.

The overall impression is one of a game released before the finishing touches are added. It lacks the roundness of a quality game and the key responses aren't what they oughta be. Nevertheless it does have a certain addictive quality, carried over from the original idea, I suppose. But why, would someone mind telling me, do the software houses continue to flood the market with copies of games already available? — **K.A.**

Game: PYRAMID PAINTER
Maker: THOR
Machine: BBC MODEL B
Format: cassette
Price: £5.95
Rating: K

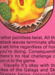




Space Swarm

Unremarkable fistful of shoot 'em ups that require patience rather than skill. Apparently I've to tackle an oncoming onslaught of alien craft single handed, the rest of the planet having evidently gone to lunch. Sound familiar?

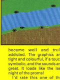
Space Swarm is rather unconventional in that although it offers five different screens you don't have to clear any of them to make any progress. But this is a rather pointless twist. All the attack waves terminate after a set time regardless of how you're doing. Consequently there's no real challenge or point to the game.



Visually it's okay with the likes of the Galags and Sky Skaters being colourfully rendered, but the sound is a little coarse. I played it with indifference. Not so much hopeless as half-baked I'd say. — **S.K.**

Game: SPACE SWARM
Maker: SOFTWARE PROJECTS
Machine: VIC 20
Format: cassette
Price: £5.50
Rating: K

Beeb's River of Death



Shades of Carol Shaw's neat *River Raid* colour this furious Amazonian roller-coaster ride for the BBC B. In it you pilot a fast, if somewhat titchy, strike plane down a ludicrously well defended river canyon in order to decimate some nameless command centre and a nest of nasty missile silos. No easy task!

Missile launchers and popping pill boxes are bolstered by screaming enemy jets and patrol ships as you progress down the river, and it quickly turns into quite a fire-fest! As you might expect on this kind of mission, both of your fire power and fuel supplies are limited. To replenish you'll need to dock with a sister ship which (first) appears at around the 10,000 point mark. Needless to say if you run out of ammo before cranking up that kind of score you're in mucho trouble!

Although I began my fighter pilot career by bemoaning the limit of one plane per game I quickly forgave the oversight and became well and truly addicted. The graphics are tight and colourful, if a touch symbolic, and the sounds are great. It loads like the last night of the proms!

I'd rate this one of the toughest, tastiest take-em-outs available for the old Beeb and consequently think it's well worth the ackers. Go give 'em hell. — **S.K.**

Game: EAGLES WING
Maker: SOFTWARE INVASION
Machine: BBC B
Format: cassette or disk
Price: £7.95 or £11.95
Rating: KKK

Swooosh!

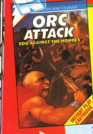
A whisker late for last winter's Olympics, but this sparky simulation of ski slope bravado is a fresh-faced, cleverly paced game that keeps one steering digit from getting too good and another itching on the replay key.

It comes in three stages — slalom circuit, ski jump and downhill — and your begoggled Olympiast has to negotiate each punishing test with scarcely a pause to dust down his irons. The slalom is a comparative pushover, the jump difficult to garner the big scores on — and the downhill is plain murder. What really lifts the game is the wealth of detail: the sound of approaching skis on the jump followed by the deathly silence when your screen-size Steiner leaps is beautifully done, and the graphics are an all-round classic. When the skier comes to an untimely halt in going for gold, a helicopter breezes on to scoop up the shattered casualty.

In one sense this is an almost perfect game for the micro user, for the lonely dedication of the Slopes Superman makes an apposite heroism for the hacker to aspire to. You won't be piste off with this one too fast. — R.C.

Game: OLYMPIC SKIER
Maker: MR CHIP
Machine: COMMODORE 64
Format: cassette
Price: £5.99
Rating: KKK

K = Could Be Better
KK = Could Be Worse
KKK = Unsurpassable



Let's Have A Show Of Heads

When Thorn EMI became Creative Sparks a few months ago they took the opportunity to dump a few pieces of naffware in their previous catalogue. One they didn't dump was *Orc Attack*.

This game has run into a little criticism from the mealy-mouthed on account of there's a lot of gore around. So what? When you're manning the mortices single-handed and endless hordes of evil goblins are scaling the walls, you do what you have to. Luckily you have handy (a) boiling oil, (b) a sword, and (c) a spear. Using these honest implements, you then proceed to slaughter as many of the opposition as you can over four wholesome screens.

Before we go any further let me just say that if you buy the farm your head falls off.

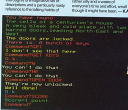
I like this game a lot. The general setup is a little like *Kaboom* — only *you* are the mad bomber, and the bombs you drop are actually buckets of high-temperature oliovascular liquids. Action and movement are very smooth — you leap to and fro along the battlements from boiling-oil store to spear rack, thumbing the fire button with an animal snarl to tip the bubbling pots over the ascending *svartalfar*. Cream the first wave and other nasties, including a sorcerer, finally take you out. But what an end!

Yes, by the Bad Breath of Helm (this *is* based on the Tolkien Helm's Deep episode, isn't it?), *Orc Attack* is a crudely-themed, highly-skilled, totally enjoyable slice of the kind of computer game that gets computer games a bad name among people who think spreadsheets in Arabic are the last word in self-indulgence. Although it's a ROM and therefore pricy, get it if you can. You'll enjoy the bit with the falling head ever so much. — **T.T.**

Game: ORC ATTACK
Maker: CREATIVE SPARKS
Machine: ATARI 400/800/XL
Format: ROM
Price: £9.95
Rating: KK

THIS ROMAN KNOWS . . .

In the neverending race to join the computer games market the software houses, as everyone knows, are adopting an attitude of if it's got 'computer game' written on it publish it'. If it goes on at this rate in six months time we can expect to fork out half a dozen hard earned oncers on something that adds two and two together. *Legion* isn't quite that bad — you've got to give it points for trying. It's an adventure., it's in Basic and it's about as amusing as eating dead cats. Naturally they've done a great job on the cassette inlay. Look at all those words, 'examine', 'smell' and 'wait'. Looks great on the shelf but wait till you get it home. All those lovely words displayed so alluringly elicit a useful response of 'eh?'. In fact apart from 'you can't do that', 'eh?' is the only response it does give. The icing on the cake is a thoroughly unimaginative set of descriptions and a particuarly nasty reference to the talking habits of women, something an intelligent author should be above. All in all rather silly and a waste of everyone's time and effort, small though it might have been. — **K.A.**



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You have found:
The cells of a centurion's house.
A very bleak and cold place with two
barred doors,leading North-East and
West.
The doors are locked.
There is: A bunch of keys.
Command?GET
I don't see that here.
Command?GET KEYS
O.k.
Command?W
You can't do that.
Command?NE
You can't do that.
Command?OPEN DOOR
They're now unlocked.
Well done!
O.k.
Command?SCORE
Score=1 point.
Command?
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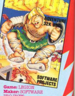


Game: LEGION
Maker: SOFTWARE PROJECTS
Machine: BBC MODEL B
Format: cassette
Price: £7.95
Rating: None

Sleep in Wolf's Clothing

Say it in a theatrical whisper: *House of the Living Dead!* Isn't it wonderful! It's the sort of title that conjures up all manner of gross George (*Dawn of the Dead*) Romero-type imagery. Unfortunately those expecting buckets of arcade blood in the gruesome manner of *Forbidden Forest* or *Orc Attack* are in for a disappointment. This is a fun but innocuous (U certificate) maze game in which power pills and ghosts have been replaced by bats and skeletons.

You must collect a segmented holy cross from each corner of the maze and return to the crypt at the centre of the screen. This is simple enough at first as you've only a single bat to contend with, but clear enough screens and you're confronted by hordes of rattling skeletons and dismembered hands (EEK).

The animation is effective and the soundtrack, namely a jovial rendition of the death march, nothing if not appropriate. It's quite a change of pace from Phipps' renowned adventures and an entertaining alternative to the dread *Pac-Man*. — **S.K.**

Game: HOUSE OF THE LIVING DEAD
Maker: PHIPPS ASSOCIATES
Machine: SPECTRUM 48K
Format: cassette
Price: £5.95
Rating: KK

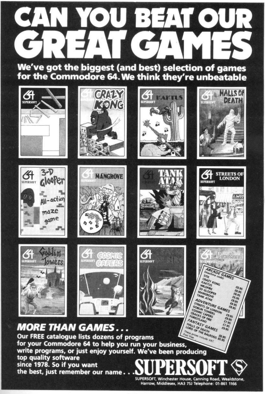
'OW YOU SAY? — "ESCAPE?"

This promising text adventure was written using *The Quill* (reviewed in BIG K No. 2) and is one of a series released by Gilsoft to promote their adventure-game editor.

Following a mood-setting loading-screen, I found myself in a sparse cell inside a prison fortress from which I had to escape and make my way across a hostile island to safety. Escaping from the prison took a while, but once free I explored a reasonably large area of the island, negotiating deadly wildlife and a tribe of cannibals, amongst other perils. However, after the rigours of escaping the prison, most of the jungle's dangers were — with reasonable care — readily overcome.

With much careful work evident in the adventure, I hope there are some real problems ahead. The well-written descriptions create a good sense of atmosphere and some excellent — often humourous — responses made Devil's Island worthwhile. Useful clues, as the guards gun you down for the Nth time, will help you get events in the correct (necessary) order, making up a little for an ineffectual help response. 'Look' doesn't mean the same as 'examine' (make sure you do) and be sure not to overlook the simple but obvious! — **T.S.**

Game: DEVIL'S ISLAND
Maker: GILSOFT
Machine: SPECTRUM
Format: cassette
Price: £5.95
Rating: KK



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WHERE ARE NEXT YEAR'S GAMES COMING FROM?

RIGHT: a standard look-down maze. Easy enough to generate but a bit passé these days.

In the last five years games software designers have fallen into some bad habits, argues TONY TYLER. Locked into endless loops dictated by the nature of present-day microcomputers, they are missing the chance to make real Quantum Leaps. But it's not all gloom . . .

ON THE FACE of it, games design is a funny thing.

On the one hand you have those people who, while they may be deficient in programming techniques, at least have a sense of originality. It is they who, most often, devise games with new themes and new ways of looking at things. On the other hand we have the undoubted wizards of the Sage IVs, the programmers who can code anything in sight with the matchless beauty of a Michelangelo, but who cannot think up games worth a damn.

Consider how often — in your own direct experience — you have detected that a particular game was all hung around one particular lick. Far too often this has been the basis of a new game or software idea. *PacMan* and its generics owe their existence to the programmer's discovery of maze generation. *Defender, Scramble* and the like came in around the time US programmers discovered how to poke the display lists on their Ataris and Apples to produce reasonably smooth horizontal scrolling. Commodore's big fat sprites marshalled in ranks gave rise to a whole style of arcade games that is still with us. The fact that ladders are fast and easy to generate on pixel grids led to the *Kong* series; and so on.

These days the one-man programmer-designer of the past is a rare creature. Jeff Minter is one obvious example; Matthew Smith is certainly another. True originality such as these men possess has always been rare enough; in their case it is the confidence begotten of success which has allowed them to let their imaginations loose and come through time after time with such genuine originals as *Jet Set Willy* and the *Mutant Camel* series.

Overall design thinking is becoming ever more important. Design teams are the fixture of today. Ultimate's peerless creations are widely thought to be wholesale team efforts, albeit under strong leadership. The top US companies like Atari also employ designers as team members. (Activision are the exception to this rule.) In other words, the art of designing games design is settling down and establishing accepted parameters, just as microcomputers are settling on the memory range 64K-128K, with the 68000 being the top favourite processor for the next generation (if there is a next generation other than MSX — but let that pass for now.)

Since a good many of you out there undoubtedly harbour ambitions to be among the Elect of the future — who'll make a fat living and drive Lamborghinis, etc. on the strength of your games earnings — it seems a good idea to examine what makes a good game — and what is likely to make a good game of the future.

ORIGINALITY

TAKE THE Maze.

You have look-down mazes, typified by *PacMan* or *Advanced Dungeons and Dragons,* not to mention a thousand others. You have vertically scrolling mazes — *River Raid* is in effect an aquatic maze. You have the side-on maze view of *Scramble;* the 3D maze of *Death Chase* and others not half so good. It seems the maze, either in graphic or written form, is endemic to computer games — since one thing computers can easily be made to generate (indeed, it suits their personality) is mazes.

Does that mean we're stuck with mazes for ever? Isn't there another form of testing a player's sense of location and ability to navigate by what used to be called Dead Reckoning?

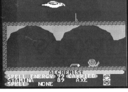
And because sprites can be turned into both players and missiles (Atari even call their patented sprite system Player-Missile Graphics) does that mean that somewhere, in every 'arcade' game, there *has* to be both a player and a missile (and therefore, by implication, an enemy)? Driving games test the reflexes, and flying games test both reflexes and intellect, but isn't there some way of producing an original piece of software (oh all right, 'game') that tests the reflexes to the testee's absolute satisfaction and yet doesn't somehow, even at the last ditch, involve mayhem and projectiles?

Not a lot of it about.

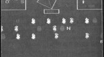
Games designers of the next five years are going to have to ditch their obsessions with the anatomy of what their machines can do and start thinking about what they can *make* it do

COLOUR

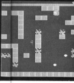
FAR TOO many computer-game screens resemble garish, recently-designed flags



LEFT: Imagine's *The Alchemist*: horizontal and vertically scrolling maze — and one of the best of the genre. But are mazes enough?



LEFT: Shooting games like Acornsoft's *Carousel* are excellent simulations but do they compare with five minutes on the real thing for fairground bliss?



Stuart Henry's
POP QUIZ
— LOADING —
©1984 Bellflower Software

POP QUIZ (left) attempted a video feel but naffed out on lo-res.

for newly-independent former colonies. All day-glo and stars, if you get me. Too much. Over the top.

It's a pity you can't get sepia and only sepia on computers. It would force designers to think Eye instead of Pixel. (ZX80, where are you now that we need you?)

To me, the news that a new computer will generate sixteen colours in any resolution mode is invariably bad news. For far too often breakthroughs like this are met by the software designers' absolute determination to *use* those 16 colours all the damn time, come what may. Boy, are those screens a riot of colour! So much a riot of colour are they that within five minutes you're bored spitless with any colours other than pure white and intellectual black, and the very idea of aquamarine or cyan makes you want to go and park your lunch in the nearest paper bag.

In the immortal words of the Electricity Boards — Save It!

TEXT

THIS HAS improved, though horrors remain.

Text comes into games for (a) title screens, (b) instructions, scores, etc., and (c) throughout (in adventures only).

Since all prompts and extraneous messages from 'computer' to punter are almost always conveyed by use of text (again, honourable exception to *Aviator* and decent flight sims), it follows that the actual use of the printed word should be a matter of some skill — a skill which, like the creation and deployment of moving graphics, needs to be studied and used as effectively as possible.

In a word, text should be "user-friendly" as possible to do its job. Since in text terms nothing yet invented is as user-friendly as a good book (I'm sticking to that) it follows that to be effective, text in computer terms has got to be readable and accessible. By "accessible" I mean the punter has got to be able to "flip pages", either backwards (to refresh memory) or forwards (to skip a bit).

But like I said, the trade has cleaned up its act recently in this respect, no doubt after getting acquainted with decent word processors. But (and this hurts, folks) to judge by the average standard of title screens on games sent in by readers to Big K, the average amateur designer has a lot to learn on this subject.

For some reason VIC-20 owners are the worst.
WORDS WRAP UNCO
MFORTABLY AROUND TH
E SCREEN LIKE TH
IS.

Misspellings occur all over the place — in commercial software too. Grammar — not to mention English — is often distinctly dodgy. There's no mystery about text handling as Computer Concepts recognised when they constructed the excellent *Wordwise*. It's simply a case of being able to go backwards at will, forwards at will, and be able to read it when you've got it.

The choice of words is still up to you. That can't change, nor should it.

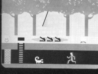
While we're on the subject, let me say a word about Adventures. Besides being location-obsessed (a characteristic of binary maths and not art) far too many of these games, so challenging in so many other ways, are still based on corny heroics of one form or another. Granted, other examples have appeared; but it still seems sad that this brave new form hasn't yet come *near* matching the skills to be found in even an ordinary novel. Is it the medium itself — the screen and so forth? Or is it yet again the constraints imposed on themselves by the programmers, who at bottom are far too often interested in what the machine will do and less interested in what may be needed.

If all this sounds a bit gloomy let me say that I feel that computer games design has just about reached the end of its first burst of speed and is pausing to draw breath and re-evaluate. When you consider that we are today playing games that in the main owe their inception to ideas being tried out more than *five years ago . . .* you can see the need. But since those far-off days much has happened. Larger memories and disc drives (you see, I'm doing it myself) have opened up *technical* possibilities simply unavailable five years ago. Greater experience and a more demanding market will — must — force the better software designers to think again. There are already signs that teams of developers, working with superprocessors and 128K machinery, are starting to put together new *forms* of computer game — by lavishing as much time and devotion as do the designers of the best business software, like *Wordstar, SuperCalc, TK!Solver* and others. It is a fact — sad but true — that more ingenuity and, yes, artistry is currently being shown by some of the mavericks who design insanely interesting packages ostensibly for IBM-owning biz types, than by the megastars of the games world. The whole idea of "thought processing" is still in early stages but nonetheless represents a giant leap in computeracy. Where is the games leap to match that? The best games these days tend to be simulations anyway — so while allowing the skill, where's the originality? What adventure, even *Zork,* outdoes *The Lord of the Rings* for ultimate D & D bliss? What arcade game can match five minutes with a .22 in a shooting gallery for marksmanship satisfaction? What flight simulator is as good as *one minute* in the real thing?

Games designers (perhaps we should stop using this word 'games') should begin to re-think their objectives — to put the computer, the screen, the disc drive — and, yes, now the laserdisc — to work for them, to realise ideas *they* have had and not ideas the construction of the computer and the other hardware have dictated. More time has to be taken, and inevitably this will mean fewer and more costly releases. Software should aim to provide the end user, no matter how frivolous or casual his motives, with a usable or at least tangible end product, probably in the form of a print-out (like the holed fairground target you tote proudly around all day). It should, in short, aim to be more of a tool. This doesn't mean "boring" — it means "useful" in the sense a guitar is both useful and frivolous at the same time.

We should all aim higher than we do. We've come a long way, but we're in danger of getting slack. This is no time for it.

It's going to be interesting . . .



PITFALL (left), yet another example of slick horizontal scrolling; but a maze is a maze for a' that.

MES
DISC
DUAL FORMAT
JCB Digger
for the BBC Microcomputer Model B

HOMICIDAL NAVVY

What I need in my games is action. I want to cruise the universe with a laser in my hand and a gleam in my eye leaving a wake of death and destruction. I mean, I wanna KILL. Somehow puttering around the landscape in a JCB Digger clearing undergrowth and keeping half an eye open for 'Meanies' doesn't seem to fit the bill. I say half an eye but sometimes you can fall asleep at the wheel looking for them. At one point I though they might have followed the path of the Dodo to extinction.

A Meany is something that gets its kicks driving JCB Diggers, yours in particular. They can be fairly easily disposed of either by pushing them into the sea or digging a hole and burying them, whereupon they drift off to sleep. Sleep? Being beanoed by three tons of rubble spells dead in this boy's book.

As I said before, Meanies are pretty scarce beasts and when you find one they ain't the brightest bucket of worms. Chances are they'll do a runner and leave you in the middle of a Meany-free landscape for the next fifteen minutes.

All in all rather a pity because the graphics are stunning. But then my habit craves blood. — K.A.

Game: JBC DIGGER
Maker: ACORNSOFT
Machine: BBC MODEL B
Format: cassette/disc
Price: £9.95 (cassette)
£14.95 (disc)
Rating: K

ZOIDS
by Gordon Russell
ZOIDS
SOFTEK
MASTERS OF THE GAME
CBM 64
for the CBM 64

We're told that Reginald Bach (Johann's cousin) invented this game back in 1726 — the first ever video game.

Zoids proves that Reg was baching up the wrong tree.

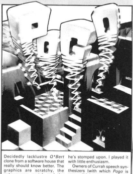
A drab plectrum-shaped object is at your command. Your task is to destroy an ever increasing number of Zoids — round blobs which begin to bounce around the screen and grow in size until they turn into large furry cog-wheels.

Destroy Zoids with the usual laser arrangement. Your secondary task is to maintain laser energy level by collecting energy packs from little spacemen that temporarily hover about the screen. As you begin to reach the higher levels of play said screen becomes a confused array of multi-coloured blobs and space-men — nearly impossible to cope with.

Not an easy game to play with, but that alone doesn't succeed in making it a challenge.

I'd rather spend the money on one of Johann's records and have a game of frisbee. — **N.X.**

Game: ZOIDS
Maker: SOFTEK
Machine: COMMODORE 64
Format: cassette
Price: £7.95
Rating: K



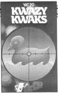
Decidedly lacklustre *Q*Bert* clone from a software house that really should know better. The graphics are scratchy, the colours are garish and the gameplay is decidedly routine. It comes as a definite downer after the excellence of other Ocean conversions like *Mr Wimpy* and *Eskimo Eddie*.

On paper (at least) *Pogo* looks fairly successful. The fat fellow hops around that familiar paint-splattered pyramid, much as you'd expect him to do, and there's the obligatory crystal ball and pig-tailed snake to avoid. In latter screens you merit extra flying discs and, what the inlay card assures me are 'aggressive scorpions' — frankly I'd never have guessed it from looking. It's the only Spectrum *Q*Bert* I've come across that retains the cuss balloon which Pogo emits when he's stomped upon. I played it with little enthusiasm.

Owners of Currah speech synthesizers (with which *Pogo* is compatible) may derive a little more pleasure from the sound, which is good. The snake hisses convincingly but it is difficult to make out whether he is saying "slither, slither" or "sniffer, sniffer"! Taunting remarks such as "last life, Pogo", or "pathetic", serve only to stiffen your resolve to beat the game into dust.

*Q*Bert* groupies are advised to look elsewhere for more authentic thrills. — **S.K.**

Game: POGO
Maker: OCEAN
Machine: SPECTRUM 48K
Format: cassette
Price: £5.90
Rating: K



Stupefying interpretation of that funfair sideshow in which you take pot shots at stupid tin ducks, stuffed toy prizes, the stall owner and wallies with candyfloss. Connoisseurs will be pleased to note that all the finger-numbing challenge of the original has been faithfully reproduced. You'll gasp as the featureless ducks 'n' bunnies trundle inexorably from left to right and you'll shiver as the clock counts down and the ammo runs out! Purists will also be pleased to hear that no odious second screen has been added to dilute the action. It's pop, pop, pop all the way. The mayhem is unrelenting. ZZZZZZZ . . . — **S.K.**

Game: KWAZY KWAKS
Maker: MR CHIP SOFTWARE
Machine: (UNEXPANDED) VIC-20
Format: cassette
Price: £5.50
Rating: None

THIS ANT'S ON FIRE

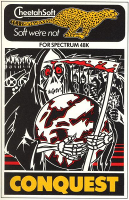
You know what it's like watching *Dallas*. J.R. has just pulled a nasty on everybody except the cat so half of Texas is lurking in the shadows with an uncanny array of weapons aimed in the general direction of his throat when a soft, smooth voice oozes from the TV set, 'tune in next week to . . .' etc. That's the way *Fire Ant* gets you. In the end I had to call on a mate for help. We worked shifts on it for a whole weekend trying to find the last screen (the eighth). On Monday morning at four o-clock I finally emerged, eyes bloodshot, body screaming for sleep but triumphant.

Setting the scene, the ants' nest has been raided by scorpions and the queen ant taken and held hostage. One small ant has been left alive and he decides to mount a solo rescue mission. Heart in mouth he takes a nosedive into the nest in search of his queen. All he has to survive is his wits and he'll need them — the scorpions pack a mean wallop.

Working through the screens requires a fair amount of logical deduction. Certain objects have to be picked up and deposited in the right place in the correct order before gates open or tunnels clear and the scorpions always seem to be in the most awkward place.

All in all a great game. I'm just going to bed for a week before I get stuck back in again. — K.A.

Game: FIRE ANT
Maker: MOGUL
Machine: COMMODORE 64
Format: cassette
Price: £7.95
Rating: KKK



CONQUEST A tactical game which even veteran players will find both challenging and rewarding.

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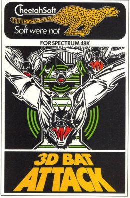
4 levels of skill. At each level the game gets faster and more complicated, and the vampires more dangerous.



AFTER THESE, THE REST IS KIDS STUFF.

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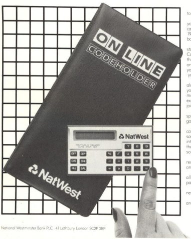

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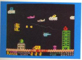

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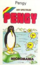
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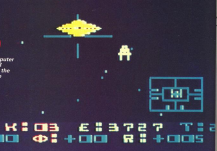
CLASSIC GAMES OF OUR TIME

No. 4: STAR RAIDERS (ATARI)

In both VCS and computer formats, Atari's STAR RAIDERS cart has set the standard for 3D space war. TONY TYLER explains why.



WAIT TILL YOU SEE THE GREENS OF THEIR EYES...

ON THE FACE of it, the plot is familiar.

There you are, sole bristle-jawed survivor of a space corps decimated by the oncoming Fnurgs (or whatever). Luckily (thanks to those good ol' Earth boffins), there's a super-duper spacecraft just completed, ready for a hotshot pilot to take it up and Do What Must Be Done. Individually, it's a match for any Fnurg ship; it's the odds that make it difficult.

Yes, it's you against the universe.

Nothing new about that, of course.

However, this particular scenario has more than shade or two of *Defender*. Your ship is better than the Opposition's. For a start, despite their numbers, you alone have the inestimable advantage of The Warp. That's right, with a press of a key you can bring up a Galactic Grid that shows you at a glance where everybody is, including your own space stations and the enemy positions. After that, it's just a matter of selecting H for Hyperdrive, F for Front View . . . and then grimly keeping the target cursor lined up on the spatial foresight as Einstein gets shot to Hell and you turn into a collection of tachyons, ending up the wrong side of FTL drive and in your chosen destination. Then . . . a brief flash of L to give you the long range radar view, a touch of the keyboard to bring your speed up to a decent combat velocity (say, 6), and it's hunt-the-spook through the starfields until your energy runs low, you take too many hits (despite Shields), or you simply cream the Opposition right outta that particular sector.

It's tough being Buck Rogers. Even tougher being his groovier younger brother Phil.

Quite when the first game designer decided to blow out the hitherto-standard gamer's viewpoint of look-down or look-along remains unclear. It remains certain however that Atari's *Star Raiders* — like many another good idea an arcade steal — required some heavy-duty 3D thinking from its designer. The starfield rushing past, for example, is done by split-screen scrolling (the split occurring vertically down the middle), but so smoothly that you fall completely under the illusion that the starfield is rushing past in every azimuth.

Then there's the simple enough idea of the cursor AS the ship — move the ship and you move the cursor/gunsight. Press fire and the hapless Zit or Fnurg or Whatever gets his lunch between his optical extensors. Blow the mother up and the interstellar debris of his remains sails past your head in delicious slow motion. Miss — or forget to switch on your shields — and you become somebody else's lunch. Scroll in any dimension. Achieve Front or Aft views. And — best of all — dock and replenish at the mother ship.

Very difficult, this one. You have to find the right galactic sector, warp there OK, use Long Range Radar to identify the friendly ship and then GO VERY SLOWLY (say, Warp 2 at max) until you get the glowing little bleeder lined up in your gunsight. Down to Warp One should see you docked. Wait while the shuttle comes out to replenish you — then off and away again.

Keep moving at high-ish speed. Keep your shields up — even if the greenish glow gets on your nerves (it's worth it). Flip between Aft and Front View. Use your Computer Gunsight until it gets shot away.

Never give up.

People don't give up on *Star Raiders*. Like a few other designs, the number of its clones is legion (no names, no pack drill . . . you know who you are). But the Atari being the machine it is (and even the VCS is full of hidden surprises), it stands to reason that any game from their golden era is going to have something of the All Time Standard about it. *Star Raiders* is not only the original 3D Space War, it's still the best. As a ROM of course it's expensive — even in VCS form (which incidentally uses a special one-time-only keypad). But with full use of the keyboard as well as superb joystick action, as well as the best visuals in the business (and some of the best sound) it's in a class of it own.

This one will Run and Run. It alread has . . .

TONY TYL

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SPRITE CREATOR

Creating sprites on the 64 is as simple as 1, 2, 3. One: Type in this listing. Two: Make sure it runs. Three: Connect your joystick and create away. This useful utility will embellish your games with sensational sprites of a superior nature.

By J. Mellon & K. Randle
for COMMODORE 64

```
0 REM  *********************
1 REM ***********************
2 REM ****SPRITE CREATOR****
3 REM ****      BY       ****
4 REM ****   J.MELLON    ****
5 REM ****      &        ****
6 REM ****   K.RANDLE    ****
7 REM ***********************
8 REM  *********************
9 S=0:DIM B(63):DIM A(9):V=0
10 PRINT"♥"
20 POKE 53280,0:POKE 53281,2
30 PRINT"■■■■■■■■■■■■■■■■SPRITE■   ■C
   REATOR"
40 PRINT"■■■■■■■■■■■■■■■1■   INSTRUCT
   IONS"
50 PRINT"■■■■■■■■■■■■■■■2■   CREATE S
   PRITE"
60 PRINT"■■■■■■■■■■■■■■■3■   SAVE SPR
   ITE"
70 PRINT"■■■■■■■■■■■■■■■4■   DISPLAY
   SPRITE"
80 PRINT"■■■■■■■■■■■■■■■5■   DISPLAY
   SPRITE DATA"
90 PRINT"■■■■■■■■■■■■■■■6■   RECALL S
   PRITE"
100 GET Q$:IF Q$=""THEN 100
110 IF Q$="1"THEN 200
120 IF Q$="2"THEN 800
130 IF Q$="3"THEN 2000
140 IF Q$="4"THEN 400
150 IF Q$="5"THEN 500
160 IF Q$="6"THEN 600
170 GOTO 100
197 REM********************
198 REM****INSTUCTIONS****
199 REM********************
200 POKE 53280,0:POKE 53281,6
205 PRINT"♥■■■■■THE SPRITE CREATER P
   ROGRAM ENABLES"
210 PRINT"■■■■YOU TO DESIGN AND MAKE
   A SPRITE AND"
215 PRINT"■■■■STORE IT ON TAPE FOR FU
   TURE USE IN  "
220 PRINT"■■■■YOUR OWN PROGRAMS.IN TH
   IS WAY ANY "
225 PRINT"■■■■NUMBER OF SPRITES COULD
   BE STORED ON"
230 PRINT"■■■■TAPE THUS CREATING A "
235 PRINT"■■■■■■■■■■■■■■!SPRITE LIBRAR
   Y!"
240 PRINT"■■■■■■■■■■■■■■■PRESS ■SPACE
   BAR"
245 GET R$:IF R$=""THEN 245
250 IF R$=" "THEN 260
255 GOTO 245
260 PRINT"♥■■■■■WHEN YOU SELECT OPTIO
   N 2,CREATE A "
265 PRINT"■■■■SPRITE,FROM THE MENU.A
   GRID OF ORANGE"
270 PRINT"■■■■BALLS WILL BE PRINTED O
   N THE SCREEN."
275 PRINT"■■■■■■■YOU CAN MOVE AROUND
   THE GRID USING"
280 PRINT"■■■■JOYSTICK IN FORT 2,
   OR THE KEY BOARD"
285 PRINT"■■■■■Z=LEFT","■■■■:=UP"
290 PRINT"■■■■■K=RIGHT","■■■■.=DOWN"
295 PRINT"■■■■■■■■■■■■■■■PRESS ■SPACEB
   AR"
300 GET R$:IF R$=""THEN 300
301 IF R$=" "THEN 303
302 GOTO 300
303 PRINT"♥■■■■■YOU LEAVE A MARK ON
   THE GRID WHEN "
304 PRINT"■■■■YOU PRESS THE SPACEBAR
   OR THE FIRE"
305 PRINT"■■■■BUTTON.TO ERASE A MARK
   JUST MOVE "
306 PRINT"■■■■THE WHITE BALL BACK OVE
```

```
   R THE MARK"
307 PRINT"▓▓██AND PRESS THE SPACEBAR
   OR THE FIRE"
308 PRINT"▓▓██BUTTON AGIAN."
309 PRINT"▓▓▓▓███████████████PRESS ▓SPAC
   EBAR"
310 GET R$:IF R$=""THEN 310
311 IF R$=" "THEN 313
312 GOTO 310
313 PRINT"▓▓███WHEN YOU HAVE COMPLET
   ED YOUR SPRITE"
314 PRINT"▓▓██JUST PRESS THE F1 KEY T
   O RETURN TO"
315 PRINT"▓▓██THE MENU.THEN YOU CAN E
   ITHER SAVE YOUR"
316 PRINT"▓▓██SPRITE,DISPLAY YOUR SPR
   ITE,READ YOUR"
317 PRINT"▓▓██SPRITE DATA AND ALSO YO
   U CAN RECALL A"
318 PRINT"▓▓██SPRITE PREVIOUSLY SAVED
   ON TAPE."
319 PRINT"▓▓▓▓████████████PRESS ▓F1█-FO
  R MENU"
320 GET R$:IF R$=""THEN 320
321 GET R$:IF R$=""THEN 321
322 IF R$="■"THEN 10
323 GOTO 321
400 REM**********************
402 REM****DISPLAY SPRITE****
403 REM**********************
405 PRINT"■▓▓▓▓▓▓▓▓▓▓▓▓████████████PR
   ESS F1 FOR MENU"
406 POKE 53281,6
410 V=53248
420 POKE V+21,4
430 POKE 2042,13
435 POKE V+41,0
440 FOR N=0 TO 62:POKE 832+N,B(N)
   :NEXT N
445 POKE V+23,4:POKE V+29,4
450 FOR X=0 TO 250
451 GET U$
452 IF U$="■"THEN POKE V+21,0:GOTO 10
460 POKE V+4,X:POKE V+5,X
470 NEXT X
480 GOTO 450
500 REM**************************
501 REM****DISPLAY SPRITE DATA****
502 REM**************************
504 Z=0:POKE 53280,0:POKE 53281,0
   PRINT"▓"
505 PRINT B(Z)TAB(5);:PRINT B(Z+1)TAB
  (10);:PRINT B(Z+2)
510 Z=Z+3
515 IF Z>61 THEN 525
520 GOTO 505
525 PRINT"▓████████████████▓▓▓PRESS
  F1"
530 PRINT"██████████████████▓FOR MENU"
540 GET W$:IF W$=""THEN 540
550 IF W$="■"THEN 10
560 GOTO 540
600 REM**********************
601 REM***RECALL A SPRITE****
602 REM**********************
605 RUN 610
610 S=0:DIM B(63):DIM A(9)
615 POKE 53280,0:POKE 53281,5
620 INPUT"▓▓▓▓▓▓▓▓▓▓▓▓▓███████████■NAME
   OF SPRITE";J$
621 PRINT"▓▓▓▓▓▓▓▓▓▓▓▓████████████PRESS
   PLAY ON TAPE"
650 OPEN 1,1,0,J$
660 FOR H=0 TO 62
670 INPUT#1,A
680 B(H)=A
690 NEXT H
695 CLOSE 1
700 PRINT"■▓▓▓▓▓▓▓▓▓▓████████████YOU NOW H
  AVE IN MEMORY"
701 PRINT"▓▓▓▓▓████████████████";J$
702 PRINT"▓▓▓▓▓▓▓▓▓████████████PRESS F1
   FOR MENU"
710 GET Y$:IF Y$=""THEN 710
720 IF Y$="■"THEN 10
730 GOTO 710
800 IF S>0 THEN 50000
801 S=S+1
805 PRINT"▓"
806 POKE 53280,0:POKE 53281,0
810 X=1024
820 FOR L=0 TO 20
830 FOR C=0 TO 23:POKE X+C,81
   POKE X+C+54272,3
840 NEXT C:X=X+40:NEXT L
850 PRINT"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓";
855 PRINT"██▓K█EYBOARD OR ▓J█OYSTICK"
856 GET A$:IF A$=""THEN 856
860 IF A$="K"THEN GOTO 30000
861 IF A$="J"THEN V=V+1:GOTO 30000
862 GOTO 856
870 PRINT"▓       PLEASE WAIT        "
910 A(1)=128:A(2)=64:A(3)=32:A(4)=16
   :A(5)=8:A(6)=4:A(7)=2:A(8)=1
920 Y=1023:T=0:O=0:R=0
1000 FOR P=1 TO 21
1010 FOR N=0 TO 2
1020 FOR S=1 TO 8
1030 IF PEEK(Y+S+R)=160 THEN T=T+A(S)
1040 NEXT S
1042 R=R+8
1050 B(O)=T
1051 O=O+1
1055 T=0
1060 NEXT N
1070 Y=Y+16
1080 NEXT P
1090 PRINT"▓▓▓███████████████SPRITE"
1091 PRINT"▓▓███████████████CREATED"
1092 PRINT"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓████████████████
   PRESS F1"
1093 PRINT"▓▓████████████████FOR MENU"
1094 GOSUB 4000
1099 GET T$:IF T$=""THEN 1099
1100 IF T$="■"THEN POKE V+16,0
   :POKE V+21,0:GOTO 10
1110 GOTO 1099
2000 PRINT"▓":POKE 53280,0
   :POKE 53281,5
2010 PRINT"▓▓▓████████████████■INSERT
   AND"
2020 PRINT"▓▓▓██████████████████REWIND"
2030 PRINT"▓▓▓████████████████BLANK  TA
   PE"
2040 PRINT"▓▓▓▓▓▓▓██████████████PRESS
   ▓▓▓▓▓-BAR"
2050 GET C$:IF C$=""THEN 2050
2060 IF C$=" "THEN 2071
2070 GOTO 2050
2071 PRINT"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓██████████████NAM
   E OF SPRITE"
2072 INPUT"▓████████TO BE SAVED";J$
2073 PRINT"▓▓▓▓▓▓▓▓▓▓▓▓███████";
2080 OPEN 1,1,1,J$
2090 CMD 1:FOR H=0 TO 62
2100 PRINT B(H):NEXT H
2110 PRINT#1:CLOSE 1
2120 PRINT"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓████████████████YOU
   HAVE NOW SAVED"
2130 PRINT"▓█████████████████";J$
2140 PRINT"▓████████████PRESS F1 FOR M
   ENU"
```

```
2150 GET X$:IF X$=""THEN 2150
2160 IF X$="■"THEN 10
2170 GOTO 2150
4000 V=53248:POKE V+21,4:POKE 2042,13
    :POKE V+41,1
4005 FOR QR=0 TO 62:POKE 832+QR,B(QR)
    :NEXT
4010 POKE V+16,4:POKE V+4,10
    :POKE V+5,125
4015 RETURN
30000 PRINT"■■PRESS F1 WHEN COMPLETED
    "
30005 JS=55296:W=0
30010 POKE JS,1
30020 IF JS<55296 THEN JS=55296
30021 IF V=1 THEN 30056
30022 GET D$:IF D$=""THEN 30022
30023 IF D$="X"THEN GOSUB 60050
    :GOTO 30100
30024 IF D$="Z"THEN GOSUB 60050
    :GOTO 30200
30025 IF D$=":"THEN GOSUB 60050
    :GOTO 30300
30026 IF D$="."THEN GOSUB 60050
    :GOTO 30400
30027 IF D$=" "THEN GOSUB 60060
    :GOTO 30500
30028 IF D$="■"THEN GOTO 870
30030 GOTO 30022
30056 IF PEEK(56320)=119 THEN GOSUB 6
   0050:GOTO 30100
30057 IF PEEK(56320)=123 THEN GOSUB 6
   0050:GOTO 30200
30058 IF PEEK(56320)=126 THEN GOSUB 6
   0050:GOTO 30300
30059 IF PEEK(56320)=125 THEN GOSUB 6
   0050:GOTO 30400
30060 IF PEEK(56320)=111 THEN GOSUB 6
   0060:GOTO 30500
30070 GET B$:IF B$="■"THEN V=0
    :GOTO 870
30080 GOTO 30020
30100 IF PEEK(JS+W-54272)=160 THEN PO
   KE JS+W,6:GOTO 30105
30101 POKE JS+W,8
30105 IF JS+W=56119 THEN POKE JS+W,1
    :GOTO 30020
30106 W=W+1
30110 IF W=24 THEN JS=JS+40:W=0
30120 POKE JS+W,1
30140 GOTO 30020
30200 IF PEEK(JS+W-54272)=160 THEN PO
   KE JS+W,6:GOTO 30210
30205 POKE JS+W,8
30205 POKE JS+W,8
30210 IF JS+W=55296 THEN POKE JS+W,1
    :GOTO 30020
30220 W=W-1
30230 IF W=-1 THEN JS=JS-40:W=23
30240 POKE JS+W,1
30250 GOTO 30020
30300 POKE JS+W,8
30310 IF PEEK(JS+W-54272)=160 THEN PO
   KE JS+W,6:GOTO 30320
30320 JS=JS-40:IF JS+W<55296 THEN JS=
   JS+40
30330 POKE JS+W,1
30340 GOTO 30020
30400 POKE JS+W,8
30410 IF PEEK(JS+W-54272)=160 THEN PO
   KE JS+W,6:GOTO 30420
30420 JS=JS+40:IF JS+W>56119 THEN JS=
   JS-40
30430 POKE JS+W,1
30440 GOTO 30020
30500 IF PEEK(JS+W-54272)=160 THEN PO
   KE JS+W-54272,81:POKE JS+W,8
   :GOTO 30020
30505 POKE JS+W-54272,160:POKE JS+W,1
   :GOTO 30020
50000 POKE 53280,0:POKE 53281,0
50005 PRINT"■■■■■■■■■■■■■■■YOU ALLREA
   DY HAVE"
50010 PRINT"■■■■■■■■■■■■A SPRITE IN "
50020 PRINT"■■■■■■■■■■■■MEMORY"
50030 PRINT"■■■■■■■■■■■■■■■DO YOU WISH
    TO"
50040 PRINT"■■■■■■■■■■■■■■1■ SAVE IT?
   OR"
50050 PRINT"■■■■■■■■■■■■■■2■ MAKE ANOT
   HER?"
50060 GET Y$:IF Y$=""THEN 50060
50070 IF Y$="1"THEN 2000
50080 IF Y$="2"THEN 60000
50090 GOTO 50060
60000 RUN 60001
60001 S=0:DIM B(63):DIM A(9):V=0
    :GOTO 805
60045 REM********************
60046 REM****BLIP SOUND****
60047 REM********************
60050 POKE 54296,15:POKE 54276,17
60051 POKE 54273,36:POKE 54272,85
   :FOR H=0 TO 13:POKE 54278,250:NEXT
60055 POKE 54276,0:POKE 54296,0:RETURN
60057 REM********************
60058 REM****FIRE SOUND****
60059 REM********************
60060 POKE 54296,15:POKE 54276,129
60061 POKE 54273,36:POKE 54272,85
   :FOR H=0 TO 13:POKE 54278,250
   :NEXT H
60062 POKE 54276,0:POKE 54296,0:RETURN
```

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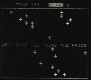
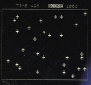
SPACE SEEKER

Invisible prizes hide in this sector of space. You are running against the clock to find it. All that lies in your way are the terrible Purple Space Bollards — avoid them at all cost! So take off on a mission that Capt. Kirk would think twice about and have fun.



TIME 356 SCORE 0

WELL DONE!YOU FOUND THE PRIZE.



TIME 496 SCORE 1068

GAME CONTROLS:

K — left
L — right
D — up
C — down

```
   2 GO SUB 3000
   7 LET hi=0: LET a$="Simon"
   8 INK 7: PAPER 1: BORDER 1: C
LS
   9 PLOT 49,148: INK 5: GO SUB
6000:
  10 PRINT AT 3,8;"PACE"
  11 PLOT 114,148: GO SUB 6000
  12 PRINT AT 3,16;"EEKER"
  14 PRINT AT 1,25; INK 6;"By";A
T 2,25;"SPM"
  15 PRINT AT 8,3; INK 4;"The ob
ject of 'Space Seeker' is to fin
d the hidden prize     shown by
the arrows at the start of each
frame.                     Avoid
the bollards("; INK 3;CHR$ 148;
INK 4;") and theedge of the scre
en."
  30 PRINT AT 16,12; INK 5;"HI S
CORE";AT 18,12;hi;" by ";a$
  48 PAUSE 0
  49 BORDER 0: PAPER 0: INK 7: C
LS
  50 LET s=0: LET li=3: LET diff
=20
  51 LET i=INT (RND*18)+2: LET p
=INT (RND*28)+2
  52 LET ti=500: LET a=11: LET b
=15: LET dir=4
  99 CLS
 100 FOR n=0 TO diff
 101 LET y=INT (RND*28)+2
 102 LET x=INT (RND*18)+2
 103 BEEP .005,y
 104 BEEP .005,y+20
```

by S. P. McNish for SPECTRUM

```
 105 PRINT AT x,y; INK 3; PAPER
0;CHR$ 146
 106 NEXT n
 110 PLOT 10,11
 111 DRAW 0,153
 112 DRAW 233,0
 113 DRAW 0,-153
 114 DRAW -233,0
 120 PRINT AT i,0; INK 6; BRIGHT
 1;CHR$ 149
 121 PRINT AT 21,p; INK 6; BRIGH
T 1;CHR$ 94
 130 PAUSE 20: PRINT AT i,0;" ":
 PRINT AT 21,p;" "
 150 PRINT AT a,b; INK 5;CHR$ (1
43+dir)
 151 FOR n=0 TO 1
 152 BEEP .009,(20-a)+20: BEEP .
01,(20-a)+10: BEEP .007,(20-a)+1
7
 153 NEXT n
 159 LET n=CODE (INKEY$)
 160 IF INKEY$="" THEN GO TO 176
 161 IF n>101 THEN LET dir=n-106
 162 IF n<101 THEN LET dir=n-96
 163 IF dir>4 OR dir<1 THEN LET
dir=4
 164 IF n=103 THEN GO TO 5000
 176 IF a=i AND b=p THEN GO SUB
2500
 180 LET ti=ti-1
 181 IF INKEY$<>"" THEN LET ti=t
i-1
 182 PRINT AT 0,6; FLASH 1;"TIME
"; FLASH 0;" ";ti: PRINT AT 0,17
; FLASH 1; INVERSE 1;"SCORE"; FL
ASH 0;" ";s
 183 IF ti=0 THEN GO TO 1000
 190 PRINT AT a,b;" "
 191 IF dir=1 THEN LET b=b-1
 192 IF dir=2 THEN LET b=b+1
 193 IF dir=3 THEN LET a=a+1
 194 IF dir=4 THEN LET a=a-1
 195 IF SCREEN$ (a,b)<>" " THEN
GO TO 1000
 200 GO TO 150
1000 LET li=li-1:
1001 IF li>0 THEN PRINT AT 11,7;
li;" lives left": FOR n=0 TO 20:
 BEEP .009,-20: BEEP .01,-15: NE
XT n: PAUSE 0: PAUSE 50: BEEP .0
1,20
1500 IF li=0 THEN GO TO 5000
1998 PAUSE 0:
1999 PRINT AT 21,p; INK 6; BRIGH
T 1;CHR$ 94
2001 PRINT AT i,0; INK 6; BRIGHT
 1;CHR$ 149
2002 PAUSE 100: GO TO 52
2501 LET s=s+(li*ti): LET diff=d
iff+1.5
2502 PRINT AT 11,1;"WELL DONE!YO
U FOUND THE PRIZE.": PAUSE 50
2503 FOR n=0 TO 60: BEEP .002,n:
 NEXT n
2504 PAUSE 0: GO TO 51
3000 RESTORE 3020
3001 FOR n=USR "a" TO USR "f"+7
3002 READ g: POKE n,g: NEXT n
3020 DATA 6,31,63,210,63,31,6,0
3021 DATA 0,96,248,252,75,252,24
8,96
3022 DATA 108,254,238,108,124,40
,16,16
3023 DATA 8,8,20,62,54,119,127,5
4
3024 DATA 60,24,153,255,255,153,
24,60
3025 DATA 0,8,4,126,4,8,0,0
3026 RETURN
5000 CLS : PRINT AT 6,6; INK 3;"
YOU SCORED ";s;" PTS."
5050 FOR n=0 TO 60: BEEP .002,n:
 NEXT n
5070 IF s>hi THEN PRINT AT 11,6;
 FLASH 1;"■*■*■*";"HISCORE";"*■*
■*■": LET hi=s: PRINT AT 13,6;"I
NPUT YOUR NAME": INPUT a$
5075 FOR n=0 TO 500: NEXT n
5080 PRINT AT 15,6;"  AGAIN?": I
F INKEY$="Y" OR INKEY$="y" THEN
GO TO 5500
5085 IF INKEY$="" THEN GO TO 508
0
5090 BORDER 1: PAPER 1: INK 3: C
LS : FOR n=1 TO 360 STEP 5: LET
m=n/180*PI
5095 PLOT 128,87
5100 DRAW COS  *80,SIN m*30
5115 BEEP .009,n/4-20
5120 NEXT n
5200 PRINT AT 4,12; FLASH 1; INK
 6;"Bye-bye!": PAUSE 0: RANDOMIZ
E USR 0
5500 PAUSE 0: PRINT AT 18,8;"INS
TRUCTIONS?": PAUSE 0: INPUT INKE
Y$: IF INKEY$="y" OR INKEY$="Y"
THEN GO TO 8
5999 GO TO 50
6000 DRAW 0,-16,(PI*3)/3: DRAW 9
,23,PI*2/3: DRAW 0,16,(PI*3)/3:
DRAW -9,-23,PI*2/3: RETURN
```

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DORKSLAYER! **Steve Keaton's Adventure Column**

Quill At The Sharp End

Some months ago, the appearance of The Quill adventure-writing tool threatened to revolutionise this arcane skill. The first 'official' batch of Quill-generated progs has just arrived — the Quill Gold collection. Our Man Keaton gives them the twice-over . . .

IT WAS WITH a disgruntled grimace that I finally admitted defeat. I'd tried until my paws were numb and my eyes radish-red, but all to no avail. The Gold collection remained intact. An arrogant pile of unyielding plastic. Quietly I wished a plague of German tourists would descend upon Gilsoft's Glamorgan H.Q.

I'd fully intended to fly through the first official (sic) collection of Quill adventures, despatching both praise and potatoes to all in equal amounts, but t'was not to be. Your humble adventurer (I use the term loosely) was soon bogged down in mire of mystery. Defeat was inevitable. I went down smiling.

The Quill is clearly the single most useful utility currently available for the potential Spectrum games designer (although with both *Scope 2* and *The Dungeon Creator* awaiting appraisal company could be on the way). Almost singlehandedly it's rescued would-be authors from the rigours of stone and chisel programming and delivered unto them a remarkable writing tool. Its creative potential is enormous. The CBM 64 version, to be available shortly, is even more exciting as it offers greater use of colour and sound as well as some much needed access to the interpreter (what I wouldn't do to dump that 'Have a nice day!' tag line). Interestingly while the entire collection has been compiled on *The Quill*, none look alike. They're all infuriatingly individual. All run on the 48K Spectrum.

The Adventures Of Barsak The Dwarf is probably the least intersting of the bunch. Assuming the role of a squat axe-wielding dwarf (no great stretch of the imagination needed there, eh Burton?) you must attempt to recover some fabled treasures of the underworld. Original indeed! The treatment is generally lacklustre and the gameplay dull. Even worse there's the dreaded 'starvation' routine to contend with. You can barely open a door before being confronted by some dumb "I'm awful hungry (rumble)" message. Fail to find some eats by the 17th turn and you unceremoniously kick the can. This exact same routine is detailed in the Quill tutorial which can only indicate an immense lack of imagination on the part of the authors. It bodes ill for the rest of the piece.

Devil's Island also appears to crib heavily from the Quill manual. Indeed the first location almost duplicates the utility's built in example! However such cheek is forgiven as it quickly becomes obvious that author Colin Smith has crafted an ingenious and devious adventure here. You begin incarcerated in some dark dank cell on the legendary penal colony and must gamely break jail and bid for freedom through the treacherous tropical rainforest. Neatly scripted with some humorous asides and ferocious puzzles, *Island* threatens to become a major headache. It appears to be the toughest adventure in the collection.

Mindbender is another riot in cell block 11 opus. Having been warped through a telephone wire

FIRST REPORT

THE GOLD COLLECTION
48 K Spectrum
Adventures of
Barsak the Dwarf
by P and V Napolitano
GILSOFT
Home Computer Software

THE GOLD COLLECTION
48 K Spectrum
Devil's Island
by Colin Smith
GILSOFT
Home Computer Software

by a unintelligible Welshman (painful), you're casually entombed in an underground prison complex, captive of a dastardly bunch intent on world domination. Streaked with humour and free sudden death routines and cheap-shot mazes, *Mindbender* is quite a lark. For example those that dare ask for help are chastised with a terse: "What do you think this is . . . *The Hobbit?*" message. Expect more info as I wade deeper.

Older Gold

An older program now repackaged in the distinctive Gold livery is *Magic Castle*. The title of course promises all manner of hackneyed clichés. You load up expecting the usual potpourri of trolls, demi-demons, monsters and maidens but (surprise) find only exploding footballs, grouchy coppers and obstinate suitcases. It's hardly a serious affair. There's a certain amount of sudden death involved and not one but two exasperating mazes so to avoid total frustration save your position frequently. Something of a dark horse I'd say.

Another elder relative is *Diamond Trail*, in which you hunt down the missing Sinclive diamond. Like *Castle* it's a little quirky and only really distinguished by a puritanical swear routine. All in all overtly zany and unremarkable.

Africa Gardens on the other hand is something of a gem. Ignore the breezy summer hols cover artwork and prepare yourself for an excellent old dark house mystery, full of creaking doors and reeking cobwebs. Beautifully written and garishly coloured it's (to my mind) the best game in the collection. Indeed it looks set to be fave of the year, which is no mean feat considering the competition. Author Tom Davies has even used the Quill to build up some quite respectable graphics! Yes, it can be done folks! Trapped inside an old dark hotel you must solve the mystery of the missing guests before joining their forgotten ranks! While creeping tremulously about the ground floor I fully expected to bump into a deranged Norman Bates and his flock of screeching violinists! I dread to think what waits upstairs once I light the candle . . .

Spyplane is another remarkble effort. This time the adventure system has been used to create, of all things, a flight simulator! In it you become captain of a long range reconnaissance plane intent on gathering information on an enemy battle fleet bobbing about some 15000 feet below. On hand there's a brace of equipment to help including sonar, radar, camera and Ionisation detectors. Thankfully there's an accompanying leaflet detailing the use of this hi-tech junk. You even get a map although this proved of little use — I spend the majority of my air time careering into fog enshrouded mountains. It's all incredibly inventive and rather puzzling. Which I guess is the idea.

And so goes Gilsoft's Volume one. A truly creditable collection of pure text adventures which'll no doubt see me pulling out nostril hairs for many months to come.

Games:
BARSAK THE DWARF (K)
DEVIL'S ISLAND (KKK)
MINDBENDER (KK)
MAGIC CASTLE (KK)
DIAMOND TRAIL (K)
AFRICA GARDENS (KKK)
SPYPLANE (KKK)
Maker: Gilsoft
Machine: 48K Spectrum
Price: £5.95

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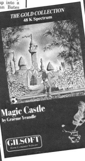
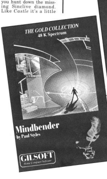
Spyplane
by David Brammer
GILSOFT
Home Computer Software





WHAT DO YOU THINK?

FINALLY, if you have any favourite adventures why not write in and tell us (a) what they are, and (b) why you like them. Perhaps you've unearthed some curious bugs you can share or maybe you're just plain stuck somewhere! Whatever the reason, write in. We wanna hear from you.

68000 ASSEMBLER

BERNARD TURNER Motorolas blithely on with his series on programming the Wonder Chip mnemonic-style. Don't know what a 'mnemonic' is? Then JMP to another location . . .

TO COMMUNICATE with the outside world Input/Output (I/O) chips are required by any computer. These are normally used as part of the keyboard, cassette port, video display chip, floppy disc and/or RS232 port hardware, depending on how the micro has been designed. In 68000-based machines these chips are "memory-mapped" and their internal registers are accessed as though they were just another part of the memory. This method is probably familiar to those of you who use 6502, 6800 or 6809 chips, but may be a little foreign to those among you who use the Z80 and its "IN" and "OUT" instructions.

Instructions tell the MPU what to do and are held as numbers stored in memory. The 68000, not being a 8-bit processor, reads instructions from memory in two-byte (word) chunks. The instruction read determines the functions performed as denoted by the particular number. Numbers are not very easy to remember, so for us humans the instructions are given names to indicate their function; these are called "Mnemonics" (Memory aids). It is these mnemonics that you type in when writing a 68000 (or any other) assembly language program. The assembler's job is to read your typed-in code (source program), converting the mnemonics back into the corresponding numbers which they represent. When the assembly is complete the MPU can then directly process the assembled numbers. This assembled program is called the "Object program".

All 68000 instructions are an even number of bytes in length. Similarly all 68000 instructions must be placed on an even numbered memory address boundary, due to there being no AO address line (do NOT confuse with the AO address REGISTER). If the instruction falls on an odd memory address then an Address Exception will occur.

Not only are Instructions and I/O chips part of the memory but so also are Data. If you program in Basic, Pascal or a similar high level language then you will not have concerned yourself with where and how your data is physically placed, or how to retrieve it. When programming in an assembly language this is now part of your jurisdiction. Data contained in memory is held only as numbers. It is how you look at and use data which determines how it appears to the person using your machine code program. Accessing of data is often termed "Addressing" — or producing different ways of determining where the data is obtained from. The 68000 provides the following methods of addressing:

EFFECTIVE ADDRESS MODES	NOTATION
Data register Direct	**Dn**
Address register Direct	**An**
Address register Indirect	**(An)**
Address register Indirect with postincrement	**(An)+**
Address register Indirect with predecrement	**−(An)**
Address register Indirect with displacement	**d(An)**
Address register Indirect with Index and displacement	**d(An,Xi)**
Program Counter Relative	**d(PC)**
Program Counter Relative with index	**d(PC,Xi)**
Absolute	**Abs.**
Immediate	**#**

(N.B. "n" can be 0 to 7.)

Implicit, also known as Implied or Inherent, addressing is also incorporated in the 68000 architecture. It is the addressing mode that is used when using instructions such as 'RTS' (Return from Subroutine). Although the Program Counter is affected, it is not explicitly stated in the instruction as the addressing mode to use.

Generally speaking the format of a 68000 assembly language instruction is in three parts (there are exceptions). The mnemonic and its associated data size indicator constitute the first part. The mnemonic states which function you require of it. After the mnemonic and a full stop the data size indicator is placed. It denotes by a "B", "W", "L", or "S" what size data to act upon. The two parts following the mnemonic and Data Size Indicator are separated by a comma and are known as the operands. The first operand of the instruction states where to obtain the data to act upon. This is called the "Source" operand. The second operand of the assembly language instruction states where the processed data will be placed when the instruction has finished. It is known as the "Destination" operand.

The Size Indicator states the number of bits associated with the instructions data: "B" for byte (8-bit) sized, "W" for word sized (16-bit), "L" for long word sized (32-bit), and "S" indicates short addressing when used with a branch instruction (16-bits). If the Size Indicator is omitted then the assembler should default to word size.

Operands, source and destination, can all use any of the applicable adressing methods (or "modes") stated above, but you will find that there are some restrictions, depending on the instruction itself — such as having the use of any adress mode for only one of the operands. That is, you may use any address mode for source OR destination operand, but possibly be forced to use a register for the other operand. These restrictions will become clearer when the instructions themselves are discussed.

Okay, we now have an idea of obtaining and storing processed data, but what can we do with it? Firstly each instruction will fall into a particular group, those being: control, arithmetic, shift and rotate, bit manipulation or logical functions. Secondly you'll find that if you are used to long statements in BASIC such as

```
●LET D=(A+B) * (A−B)●
```

then you can forget all about that! Small is beautiful! The process will have to be broken up into small steps such as:

```
●LET C=A+B●
●LET D=A−B●
●LET D=C * D●
```

We'll now attempt to simulate this in 68000 code!

If the example below is considered with the 'parallel' of D1 synonymous with "A", D2 with "B", D3 with "C", D4 with "D" then it may become clearer. (If all those vitamins don't make you clearer nothing will!)

EXAMPLE

```
.BEGIN
  MOVE.W  D1,D3   store "A" in "C"
  ADD.W   D2,D3   sum "B" TO "C", " 'C'
calculated"

  MOVE.W  D1,D4   store "A" in "D"
  SUB.W   D2,D4   subtract "B" from "a"
contained in "D", " 'D' calculated"

  MULS D3,D4   multiply "c" by "D" plac-
ing result in "D", " 'D' calculated" .FINISH

JMP FINISH   stop processing falling
through.
```

This source listing contains four fields (areas) on each line. Reading across from left to right we have a 'label' field used to assign values that the assembler and programmer use instead of actual addresses. This is so that the program is easily reassembled in different locations. Secondly we have the mnemonic field and its attendant Data Size Operator. In the third field we find that we have two pieces of information for the most part, namely the source and destination operands (the exception in this example being the JMP instruction). Finally in the fourth field we have comments. Comments are not part of the finally-assembled object program. They are there, like REMS in BASIC, merely as an aid to the programmer.

Quickly skipping over the label "begin" we come to the instruction "MOVE". This instruction is one of the most used instructions, especially if you are interested in doing character graphics on a bit-mapped screen, say for example on the Sinclair QL. The MOVE instruction comes in several varieties; the one concerning us here is termed by Motorola as "Move data from Source to Destination". What it does is to obtain data from the place indicated by the source operand — in this case from the Data register 1 (D1) — and place it where the Destination Operand dictates. In this example it is placed in Data Register 3 (D3). You should be careful when using the MOVE instruction, because it overwrites without thought whatsoever for what is contained in the Destination location. MOVE can also cause disaster if used when trying to read from I/O chips (e.g. 6850 ACIA) that clear their internal states when read. (To overcome this problem there is another instruction called MOVEP which we will discuss later.) The MOVE instruction does not affect the source operand at all, but it does affect the flags in the processor's condition code register. It always clears the Overflow and Carry Flags to zero. It sets the Negative Flag to "1" if the result is negative, otherwise it clears it to zero. It sets the Zero Flag to "1" if the result is zero, else it clears the flag to zero. The Extended Flag is unaffected. You may also like to note that the size of the data moved is word sized; because of this it will not affect the two most significant bytes in either source or destination. Other sizes permissible are Byte and Long Word. Permissible Address Modes are for:

MODE	source	destination
Dn	**yes**	**yes**
An	**yes***	**no**
(An)	**yes**	**yes**
(An)+	**yes**	**yes**
–(An)	**yes**	**yes**
d(An)	**yes**	**yes**
d(An,Xi)	**yes**	**yes**
Absolute	**yes**	**yes**
d(PC)	**yes**	**no**
d(PC,Xi)	**yes**	**no**
Immediate	**yes**	**no**

***Byte size not allowed.**

ADD, like MOVE, has two operands, source and destination. This instruction is best thought of as 'sum source to destination' — that is, add (in binary format) the source to the destination and place the result in the destination. In this example the size operand is set to 'word', thus only the lower two bytes of the registers D3 and D2 are used. Similar to the MOVE instruction described above, the Source Operand is read only, and thus does not change. The Destination will contain the result of its previous contents and the contents of the Source Operand, summed together. Those of you out there who have programmed the 6502 and are familiar with its 'ADC' (Add With Carry) instruction may like to note that the Carry Flag is not added into the result when using this 68000 instructions. Thus the Carry Flag does not affect the result placed in the destination operand. After the ADD has been done the Condition Code Registers flags are set as follows, depending on the result:

FLAG	SET	CLEARED
N	**Negative**	**If zero or positive.**
Z	**Zero**	**If not zero.**
V	**Overflow**	**If no Overflow occurred.**
C	**Carry Generated**	**If Answer can be contained in Destination.**
X	**Copies the C flag.**	

When using the ADD instruction one of the operands MUST use a data register as one of the operands. If you are using it as the Destination Operand then any Effective Address mode is applicable for the Source Operand (including any data register). If you don't use a data register as a Destination Operand, you MUST therefore use a Data Register as the Source Operand. If this is the case then only the following Effective Address Modes are allowable for the Destination Operand:

Modes Allowed when the Destination Operand isn't a Data Register:

(An) (An)
(An)+ (A
–(An) –(
d(An) d)
d(An,Xi)
Absolute

The Second MOVE is the same as the first MOVE except that Data Register D4 and D1 are used.

The Subtraction instruction takes the Source from the Destination Operand, placing the result in the Destination. Like the ADD instruction it is carried out in binary arithmetic. The instruction has identical restrictions to the ADD instruction, regarding the necessity to use a Data Register as one of its operands. Flags affect, and are affected, in an identical manner to the ADD instruction. In this example D2 is subtracted from D4. The result is placed in D4.

MULS is the 68000 mnemonic that represents the instruction to do a signed multiply of the Source Operand and a Data Register, which must be used as the Destination Operand. All Effective Address modes (except An) are allowed for the Source Operand. The instruction takes both operand's data as signed 16-bit numbers, producing a signed 32-bit result which is placed in the Destination Operand. In the example above the D3 register is multiplied with the D4 register. The result is placed in D4. No flags affect the operation of this instruction, but all of the flags in the Condition Code Register (except the X Flag) are affected by the result. The flags are affected in the following manner:

FLAG

N Set if the result is negative, cleared if the result is zero or greater then it is cleared.

Z Set if the result is zero, if it isn't zero then it is cleared.

V Always cleared in zero.

C Always cleared to zero.

I have included a JMP instruction at the end of the program to stop the processor continuing further into memory; if it did so then it would try to execute unintended instructions that the memory contain thus it acts as a 'safety net', not allowing processing to fall through. The JMP instruction directs the processing from a position in memory to a position indicated by its operand, i.e. It 'jumps' the processing to a new location. The assembler will substitute the value of a label as an instruction's operand. A label is given a value by typing the label's name in the label field. In this example of JMP we have a label 'Finish' as the operand. The JMP instruction requires an address to jump for its operand. Immediately before the instruction, in the label field, 'finish' has been typed. This allocates 'finish' the value according to its location. Anywhere 'finish' is used in the source program the assembler will substitute the value it has been allocated. The assembler will therefore generate the address of the JMP instruction as the label's value. When the instruction is executed it will jump back to the start of the JMP instruction and then execute the JMP again — creating an endless loop. If you run this program you will find that the only way to reclaim the machine is either to press the reset switch or jiggle the power. The JMP instruction is not affected, and has no effect, on the Condition Code Flags. Generally a preferable method of ending a program is to use an 'RTS', 'RTE' or 'RTR' instruction to return you to the calling program. We shall be looking at these in future articles.

RECAP

We have briefly looked at I/O Devices as part of the memory map. We saw that 68000 instructions are formed from a Mnemonic, data size operator and the mnemonics operands (if the instruction requires them). That Operands could be up to two in number and that they are termed the Source and Destination. Following this it was pointed out that there were restrictions on permissible addressing modes for operands and that the restrictions were dependent on the particular instruction. The format of an assembly language source line was discussed and finally a small example was explained. Continuing the series we will look at address modes in more detail.

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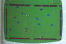
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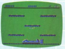
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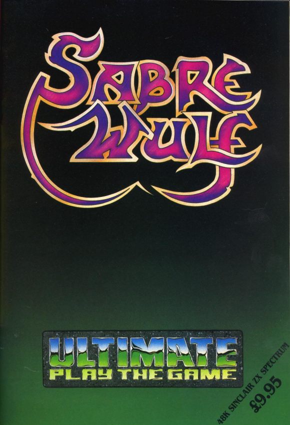
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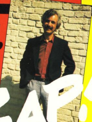

You don't have to be 13 years old with zits to be a whizz-kid. TERRY WATTS, K-TEL'S ace code-goader, is a withered 42, for example. AND a former Ballroom Dance champion. How unlikely a combination is that? NICKY XIKLUNA investigates . . .

TERRY WATTS, star K-TEL programmer, admits that he's not only a veteran of the Rock and Roll generation, but an uncontrollable manic enthusiast.

Terry's arrival is best equated with that of the fireball that suddenly zaps across the screen in his game, *City Attak*. Swarthy, bright-eyed and mustachioed, he has a wiry dancer's frame that has turned its way through many a tango in his other life as a dance teacher.

A Dance Teacher??

So how did the Suave Southender get programming?

"A dead giveaway of the manic enthusiast is fascination with gadgetry. Computers seemed like a gadget *par excellence*. I just had to have a go. So I built one."

A few months later, Quicksilva found themselves with *Quintic Warrior*, a Vic-20 best-seller.

CLASSICS

Terry wants to write classics — games that are totally absorbing time after time. "Some games simply prey on your ego," explains Terry. "You are compelled to keep playing out of sheer frustration, but you don't actually like them." Terry has written two very sophisticated games for K-Tel, *Odyssey* and *City Attak*, which certainly prove his pudding. We asked him for the recipe.

"I don't start by trying to think up original ideas. I play for hours, searching for a 'hook'. A movement, perhaps, only lasting a few seconds — but one that you want to keep doing again and again. That's my trigger to a train of thought — and I'm off!"

Mistakes can also be a source of inspiration. Should you get shot whilst playing *City Attak*, observe the flickering tongues of flame that engulf your prone craft. Realistic, huh? Terry stumbled across this effect when he forgot to terminate a lightning flash. It combined with another character, and the resulting sprite sparkled alluringly. "Eureka!" cried Terry, for he had Discovered Fire.

Being a little older than the common garden whizz kid has its problems. Running a busy dance studio and a young family take up a lot of time. Terry's favorite programming hours are midnight to 6 am. **(Nothing unusual there — Ed.)** His young son 'persuaded' him to become nocturnal in order to avoid distractions. Whilst finishing a complex game, Terry was distracted by the boy. "Look, Daddy!" said Simon, brandishing an electrical plug and beaming with pride. The whole program vanished down the tube. Horrified, I asked Terry what he did about it.

"Patted him on the head," said Terry. "Hard."

But Terry also finds advantage in extra years. "I'm not as easily distracted as a 19-year-old. The young haven't tasted disappointment, and don't realise just how hard it is to succeed. You've got to be completely set on what you're doing. The most important thing is never to give up." No doubt manic enthusiasm helps.

ENGINEER

Terry had no formal education. He informed his careers advisors that he was going to be a television engineer. He was offered a choice of jobs: road sweeper or park attendant.

Our hero nevertheless managed to become a television engineer, but failed to find the glamorous life he'd forseen. It was then he began to ruminate on the idea of rock-stardom.

Unfortunately, his band consisted of fifteen guitarists who preferred to fantasise about their impending stardom than practise their instruments.

All except Terry. (But then he had that old M.E.)

"The only way we could get through a number was to split the lead into sections so that we could take turns in each doing a little bit." Meanwhile, the guy who was supposed to be playing lead, mimed.

This glorious group finally found themselves a drummer. It was then that it dawned on them that none of them could keep time. They promptly (and wisely!) disbanded.

Terry grows pensive. "There are parallels between what was happening then, and where we are now in computing. For a while it seemed that the world of music could be anyone's oyster. Then the industry became increasingly professional. In computing, the importance of the programmer is dwindling as P.R., advertising, distribution, etc. become equally vital. The competition and the standards are hotting up all the time. Professionalism has become the most important thing in writing today."

So what is Terry up to Professionally? "Oh, it's a completely new concept in game-play." Well? "All I can say is that it uses 50K of machine code, and I'm half way through it." This irrepressibly ebullient chappie had suddenly gone quiet. Could this perhaps be Terry's adventure debut? Could it be K-Tel's newly-announced blockbuster?

At this point he looked at me solemnly, and placed a hand over my mike. I can say no more . . .

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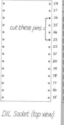
BOOST
BRA

Excellent machine though it is in every way, the Acorn BBC Model 'B' is hampered by lack of on-board RAM memory (as anyone running the BBC DOS would agree). There are times when every byte can be vital. In this article, KIM ALDIS explains how to add another 2K in the form of a 'RAM chip' — to fit in those handy Sideways ROM sockets.



DIL Socket (top view)

SO YOU'VE built your Big K EPROM Programmer and probably tried it out. If your first experiences of EPROM blowing was anything like mine you probably had to erase the chip, alter the software, reblow the chip, kick the cat and start all over again when the chip still refused to work. After about a week all I had to show was no cat and a worn out EPROM.

Before you throw the thing out of the window, there is an alternative. 2K RAM chips have pinouts very similar to EPROMS so they can be adapted to fit a sideways ROM socket, and they only cost about a fiver.

2K doesn't sound very much but 2K means 8 pages of memory. That's easily enough to develop utilities and average sized routines on and an advantage of around thirty pounds over an 8K chip certainly makes it appealing.

First of all the ingredients. You will need one 28 pin DIL socket and a Hitachi 6116 LP 2K static RAM chip. These are available from Technomatic or Watford Electronics and should cost about a fiver all in.

A word of warning about the chip. This is what's known as a CMOS device which means it's very prone to static electricity. Your body is capable of storing static electricity in enough quantity to destroy the chip so don't touch the pins until you have to. Before you do, earth yourself by touching a radiator or cold water pipe.

While on the subject of warnings the operations described here mean opening up the computer. Some parts inside can be damaged by rough treatment and some parts are more than capable of damaging you if the machine is still on. So BE CAREFUL! Turn off and unplug the computer before you open it up and treat it with respect. Neither the author nor Big K can accept any responsibility for damage done to either you or your computer by haphazard messing around.

One slight problem is that there are four more pins on the EPROM than on the 2K chip so we need a way of getting the right pins in the right holes. Jumping up and down on it doesn't seem sensible so we'll cut down the DIL socket and use that as an adaptor.

Take a look at diagram (1) and you can see how the adaptation is made. A minor amount of soldering is required but this should cause no great problem as long as you DON'T do it over the computer. Hot solder hurts circuit boards.

First of all use a small pair of side cutters to cut pins 26 and 23 from the DIL socket. Turn the socket over and insert the chip into the socket as shown. Make sure that the notch is at the top and that the four free holes of the socket are also at the top.

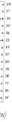
Insulated

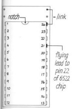
Now comes the soldering. The first is a link from the top right hand pin of the chip to the top right pin of the socket. The next is a 'flying lead' from pin 21 of the chip and should be around six inches long. Both these leads should be insulated single core which you should be able to get from the same place as the chip.

Now we can insert the chip which means opening up the computer. First of all TURN IT OFF. UNPLUG IT!

Look at the back and the underside of the computer. You should see four screws

TYOUR BEEB'S NPOWER!





marked 'FIX', two on the back and two on the bottom. Remove these and top of the computer will lift off. Remove the ribbon connector fromthe keyboard circuit board by carefully prising it with a small screwdriver and then undo the retaining nuts on either side of the keyboard. Now unplug the loudspeaker leads from the main circuit board, noting which way round they go and put the whole lot to one side.

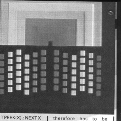
Take a look at diagram (2). The ROM sockets are the four in the bottom right numbered 12 to 15. If you have no extra ROMs then Basic is probably in socket 12. When the BBC powers up it gives priority to the first chip it reaches, working from the right. We would quite like it to stay that way and so we shall have to shift the Basic chip to the rightmost socket. Incidentally if you have the DFS then this chip will be in the rightmost socket and should stay there. To get the Basic chip out gently put the blade of a screwdriver under the top end and prise it loose, then do the same at the other end, being careful not to bend any pins. The chip should now be loose enough to ease out by hand. Now replace it in the rightmost socket (15) by putting one end in first then gently easing down the other end. A firm push (not jumping up and down on it) should see it into place.

You can now insert the RAM chip, already in its socket, into socket 12. This should go in the same way as the Basic chip, with the notch at the top.

The flying lead which you soldered to pin 21 has to be soldered onto the 6522 VIA chip. That's IC69 as shown in the diagram and is soldered onto pin 22 as shown. This has to be done over the main circuit board so BE CAREFUL!

Now you should be all set up and raring to go. Reassembly is the exact reverse of dissassembly but remember, replace the cover before you switch on. If everything is O.K. the computer should function as normal and you're ready for the software. This is basically a skeleton machine code routine to put into the RAM chip so you know that it's working. Andy Green's article in the May issue of Big K gives a pretty good idea of how the ROMs work so I won't go into too much detail. The Basic section contains two routines, PROCread and PROCwrite which you can use to read and write to the chip. To read from the chip at location 'address' use PROCread(address) and use PROCwrite(data,address) to put the number 'data' into location 'address'. Simple isn't it? Alternatively if you want to dump a whole section of machine code to RAM use PROCdump. This routine dumps the 2K buffer at &3000 to &37FF into paged RAM but don't forget that the chip must have a header code at the start. If you want a different title to the one I've given then that's in Andy's feature as well.

```
   5 REM*********************
  10 REM** 2K RAM LOADER **
  20 REM*********************
  30 REM******** <C> *******
  40 REM**** KIM ALDIS ****
  50 REM****** 1984 *******
  60 REM*********************
  70
  80
  90 MODE7
 100 buffer%=&3000
 105 OSRDRM=&FFB9:OSASCI=&F
FE3:OSNEWL= &FFE7
 110 PROCheader
 120 PROCassemble
 130 PROCdump
 140 END
 150
 160 REM____________________
 200
 220 DEFPROCheader
 230 !buffer%=&4C80724C
 240 !(buffer%+4)=&13828024
 250 !(buffer%+8)=&53455401
 260 !(buffer%+12)=&00524554
 270 !(buffer%+16)=&00302E31
 280 !(buffer%+20)=&4B294328
 290 !(buffer%+24)=&444C412E
 300 !(buffer%+28)=&31205349
 310 !(buffer%+32)=&00343839
 320 ENDPROC
 325
 330 REM____________________
 335
 340 DEFPROCassemble
 360 FOR pass%=4 TO 6 STEP 2
 370   P%=&8024:O%=buffer%+&24
 380   [OPT pass%
 390   .servloc
 400         PHP
 410         CMP #9
 420         BEQ help
 430         CMP #4
 440         BEQ command
 450         PLP
 460         RTS
 470   .command
 480         PHA
 490         TYA
 500         PHA
 510         TXA
 520         PHA
 521         LDX #0
 530   .test
 540         LDA (&F2),Y
 550         AND #&DF
 560         CMP call_code,X
 570         BNE not_ours
 580         INY
 590         INX
 600         LDA call_code,X
 610         BNE test
 620   .ours
 630         JSR langloc
 640         PLA
 650         TAX
 660         PLA
 670         TAY
 680         PLA
 690         LDA #0
 700         PLP
 710         RTS
 720   .not_ours
 730         PLA
 740         TAX
 750         PLA
 760         TAY
 770         PLA
 780         PLP
 790         RTS
 800   .help
 810         PHA
 820         TYA
 830         PHA
 840         TXA
 850         PHA
 860         JSR OSNEWL
 870         LDX #0
 880   .loop1
 890         LDA &8009,X
 900         JSR OSASCI
 910         INX
 920         CMP #0
 930         BNE loop1
 940         JSR OSNEWL
 950         CLC
 960         BCC not_ours
 970   .langloc
 980         LDY #0
 990   .loop2
1000         LDA text,Y
1002         BEQ end
1010         JSR OSASCI
1020         INY
1030         BNE loop2
1035   .end
1040         RTS
1050   .call_code
1060         EQUS"TEST"+CHR$&
1070         EQUB 0
1080   .text
1090         EQUD &0D0D0D0D
1100         EQUD &20202020
1110         EQUD &4F57818D
1120         EQUD &0D212157
1130         EQUD &20202020
1140         EQUD &4F57818D
```



OF HIGH JINKS AND ANTICS...

In the third part of this award-winning, epoch-making and ice-breaking series on ATARI GRAPHICS, NIGEL FARRIER explains how, by some discreet twiddling with the display list, all sorts of bizarre and jewel-like effects become possible. Like redefined and multicoloured character sets, for example . . .

MANY OF the colourful games that are available today on Atari do not actually use any high resolution graphics mode. They simply use a GRAPHICS 0 screen and colour. According to the Atari reference manual you can only have one colour with two luminances. However, there is an extremely simple way of obtaining four colours in a GRAPHICS 0 screen and also have a high resolution definition.

The Antic chip

The answer lies with the ANTIC chip. Although you only have twelve possible GRAPHICS commands, there are a possible sixteen different screens (assuming no interrupts and fancy programming). For those of you with one of the new XL computers life is made much simpler as they have been built into the GRAPHICS statement.

One of the major functions of the Antic chip is to control what appears on your television screen. To do this it needs several pieces of information. Firstly it requires a set of instructions that tell it what mode it is in and secondly it needs to know where to find the screen data. The set of instructions for Antic is known as a display list and the address of the display list is held in locations 560 and 561.

When you are in a GRAPHICS mode 0 screen, Antic is actually in mode 2! (Typical, things are never as straight as they should be.) Our multicoloured GRAPHICS mode 0 is Antic mode 4. Therefore all we have to do is to slightly alter the figures in the display list into fooling Antic that it is in mode 4.

The Display List

Firstly let us look at the ordinary display list. As I have already stated, its location is held in 560 and 561 and can be found by the following simple piece of arithmetic:

```
DL = PEEK (560) + PEEK
                (561)*256
```

Location 561 holds the 'high byte' of the address and 560 the 'low byte'. We therefore have to multiply the high byte by 256 (remember last month and pages being 256 bytes long?) and add in the low byte. The variable DL now contains the starting address of the display list. In order to see what the display list contains type in the above and follow it with

```
FOR X = DL TO DL + 31:
PRINT PEEK(X),: NEXT X
```

If you have typed it in correctly you will get a stream of numbers appearing on the screen.

The first three numbers should be 112 which tell Antic to put a few blank lines at the top of the screen. You should then have the number 66 followed by two other numbers depending upon how much memory you have got. Following this will be twenty three 2's. Finally another three numbers depending upon the state of your memory.

GRAPHICS mode 0 is ANTIC mode 2, remember. Right in the middle of this list we have a mass of 2's telling the Antic chip what mode it is in for that display line. We therefore have to change all the 2's into 4's.

If you look at the list of numbers again you will see that the fourth number is 66. This is actually made up of 64+2. This therefore has to be changed to 64+4, i.e., 68. If you now type in the following program it will convert the whole screen in Antic mode 4 and put something on the screen so that you can see the effect.

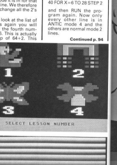
```
10 GRAPHICS 0: LIST:
                LIST
20 D = PEEK(560) +
      256*PEEK(561)
30 POKE DL+3,68
40 FOR X=6 TO 28
50 POKE DL+X,4
60 NEXT X
```

What appears on the screen is virtually illegible. You have got multicoloured characters. Just to prove that it really is there alter line 40 to read:

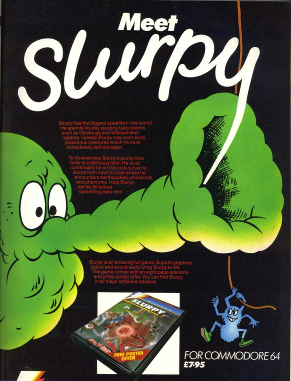
```
40 FOR X=6 TO 28 STEP 2
```

and then RUN the program again. Now only every other line is in ANTIC mode 4 and the others are normal mode 2 lines.

Continued p. 94



Meet Slurpy



Slurpy has the biggest appetite in the world! He spends his day slurping tasty snacks such as Glowbugs and Widowmaker spiders. Greedy Slurpy may even slurp poisonous creatures which he must immediately spit out again.

To his enemies, Slurpy's plump little body is a delicious titbit. He must continually be on the look out as he slurps from cave to cave where he encounters earthquakes, whirlwinds and phantoms. Help Slurpy eat his fill before something eats him!

Slurpy is an amazing fun game. Superb graphics, colour and sound really bring Slurpy to life. The game comes with an eight page scenario and a free poster offer. You can find Slurpy in all major software retailers.

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SPEED ARENA

by
M. Gral

```
5 REM*SPEED ARENA            BY M.GRAL
   EY
10 PRINT"⌐"
11 HI=100
15 SC=0:L=1:LI=3:GOTO 250
20 X=0:Y=0:DI=0:C=30720:A$="":B$=""
30 POKE 36879,27
40 FOR F=7680 TO 7701:POKE F,160
   :POKE F+C,0:NEXT F
50 FOR F=7680 TO 8164 STEP 22
   :POKE F,160:POKE F+C,0:NEXT F
60 FOR F=8164 TO 8185:POKE F,160
   :POKE F+C,0:NEXT F
70 FOR F=7701 TO 8185 STEP 22
   :POKE F,160:POKE F+C,0:NEXT F
100 FOR W=1 TO 100
105 GET A$:IF A$<>"A"AND A$<>"Z"AND A
   $<>"L"AND A$<>":"THEN A$=B$
```

```
110 IF A$="L"THEN X=X-1:DI=60:SC=SC+1
120 IF A$=":"THEN X=X+1:DI=62:SC=SC+1
130 IF A$="A"THEN Y=Y-1:DI=1:SC=SC+1
140 IF A$="Z"THEN Y=Y+1:DI=22:SC=SC+1
145 B$=A$
150 P=7910+X+22*Y
160 IF PEEK(P)<>32 THEN 300
170 POKE P,DI:POKE P+C,2
180 FOR Q=1 TO L
190 A=INT(RND(1)*500)+1
200 POKE 7680+A,160:POKE 7680+A+C,0
210 NEXT Q
220 FOR T=1 TO 25:NEXT T
230 POKE P,32
235 PRINT"▚■▚ SCORE:"SC" HI:"HI
240 NEXT W
245 L=L+1
250 PRINT"⌐■ENTER ARENA"L
```

```
26
27
28
30


31


31
32

33
34


35
```

Up your Macho Moment!

Steer your buggy around the rapidly-materialising obstacles and win silver cups, champagne and the chance to go on Name That Tune with Murray Walker! Get girls! Lose spots! Up your Macho Moment! All you need for perfect celestial harmony and clean spark plugs is to remember that A and S move you left and right, while L and (do the vertical equivalent. Rrrrrrrrummmm!

```
260 FOR T=1 TO 500:NEXT T
270 PRINT"⊐"
280 GOTO 20
300 POKE P,160:POKE P-1,160
   :POKE P+1,160:POKE P-22,160
   :POKE P+22,160
310 POKE P+C,4:POKE P-1+C,4
   :POKE P+1+C,4:POKE P-22+C,4
   :POKE P+22+C,4
315 POKE 36877,200
320 FOR S=15 TO 0 STEP-1:POKE 36878,S
   :FOR T=1 TO 50:NEXT T:NEXT S
330 POKE 36877,0
340 FOR E=0 TO 3:POKE P,32:POKE P-E,42
   :POKE P+E,42:POKE P-22*E,42
   :POKE P+22*E,42
350 POKE P+C,2:POKE P-E+C,2
   :POKE P+E+C,2:POKE P-22*E+C,2
   :POKE P+22*E+C,2
360 POKE 36878,10:POKE 36875,200
   :FOR T=1 TO 25:NEXT T:POKE 36875,0
370 POKE P,32:POKE P-E,32:POKE P+E,32
   :POKE P-22*E,32:POKE P+22*E,32
380 NEXT E
385 LI=LI-1
390 IF LI>0 THEN 250
400 PRINT"⊐■◪     SPEED ARENA      ■"
405 PRINT"YOU WRECKED ALL YOUR  CARS."
410 PRINT"YOU SCORED"SC
420 IF SC>HI THEN PRINT"A NEW HI SCOR
   E":HI=SC:GOTO 440
430 PRINT"HI SCORE"HI
440 PRINT"PRESS P TO PLAY"
450 GET Z$:IF Z$<>"P"THEN 450
460 PRINT"⊐":GOTO 15
```

WIN

in our super

This month BIG K, in conjunction with K-Tel, is proud to present one of the most exciting competitions ever run by a computer magazine.

The lucky winner will receive (a) a week for TWO PEOPLE* in Florida, USA; (b) all expenses including flight, hotel, car hire and £500 SPENDING MONEY; and (c) a trip to the Kennedy Space Center. It's the trip of a lifetime and it's ONLY in BIG K.

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*One of whom MUST be an adult with a driving license

ABOVE: THE SHUTTLE boosts into orbit from Cape Kennedy, Florida. RIGHT: Inside the big bird. The winner won't get this far, but car hire is free!

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There is no entry fee but all entries must be on a proper printed coupon cut from BIG K and must bear the entrant's own name, age and address.

Every accepted entry will be examined and the First Prize awarded to the entrant who, in the opinion of the judges, has shown the most skill and judgment in assessing the merits of the alternative factors for each of the nine pairs. Remaining prizes will be awarded for the next best entries in order of merit. No entrant may win more than one award.

In the event of a tie or ties for any prize(s) then a further test of skill will be conducted by post between tying competitors to determine the eventual winner(s) or winning order.

All prizes must be accepted as offered. There can be no alternative awards, cash or otherwise. If the First Prizewinner is aged under 18 then parental consent must be provided before the prize can be awarded. The winner *must be* accompanied by a responsible adult on the holiday which can be taken any time during 1985, subject to availability of bookings.

Any entry received after the closing date will be disqualified as will any received mutilated, illegible, altered, incomplete or not complying with the rules and instructions exactly. No responsibility can be accepted for entries lost or delayed in the post or elsewhere. Proof of posting will not be accepted as proof of receipt.

The judges' decision and that of the Editor in all other matters affecting the competition will be final and legally binding. No correspondence can be entered into.

The competition is open to all readers in Great Britain, Northern Ireland, Eire, the Channel Islands and Isle of Man except employees (and their families) of IPC Magazines Ltd., the printers of BIG K or of K-Tel and their publicity agents.

All winners will be notified and the result published later in BIG K.

COMPARE THESE FACTORS

1/	A. loading title page	B. attractive packaging
2/	A. good graphics	B. original concept
3/	A. keyboard/joystick option	B. choice of starting level/speed
4/	A. increasing difficulty screens	B. random features providing different game each play
5/	A. high scores table	B. 'stop action' option
6/	A. smooth scrolling	B. continuous sound effects
7/	A. practice level	B. on-screen instructions
8/	A. machine-code/compiled basic	B. available for various machines
9/	A. clear documentation	B. on-screen scoring

HOW TO ENTER

Here are nine pairs of factors which are to be considered when creating an arcade game suitable for home computers. Of course, a commercial success is the main aim and so all the factors are desirable. However, for the purposes of this competition what we want you to do is decide which of the two possibilities in each pair is more important when trying to design an appealing home computer arcade game — is it A or B or are both EQUALLY important?

Write the key letter (A or B) of each chosen answer in the appropriate space on the entry coupon but if you consider them both to be of equal merit mark a cross (X). For example, if you think that "loading title page" is more important for the first pair put A under 1 on the coupon. If you think "attractive packaging" is of greatest importance put B but if you think they are of EQUAL merit put X.

When you have completed all nine pairs in this way, complete the coupon — in ink or ballpoint — with your full name, age and address and then post your entry in a sealed envelope to: BIG K/K-Tel COMPETITION, 55 EWER STREET, LONDON SE99 6YP to arrive no later than Friday, August 31, 1984, the closing date.

IMPORTANT: Before sealing, copy out on the outside back of the envelope the nine key letters in EXACTLY the same order as they appear on your completed coupon. Do not enclose any other correspondence. FAILURE TO COMPLY MAY RESULT IN YOUR ENTRY NOT BEING CONSIDERED.

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1	2	3	4	5	6	7	8	9

NAME.. AGE ....

ADDRESS ....

....

....

please cut neatly around this line

PETITION • COMPETITION • COMPETITIC

WONDER WIDGETS

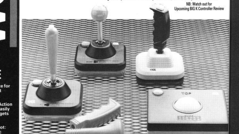
WICO, YOUCO, THEY ALL CO

You've been able to get the Wico range of joysticks in this country for some time now, though not "officially". Those who have had any experience with these American controllers know them to be without equal for durability and sweetness of action. Now they've found a home in the UK on a permanent basis. CGL, who already distribute the Sord M5 computer plus the largest range of standalones in the UK, have now picked up the Wisconsin company's action in this country.

Like all US companies, Wico target Atari, Apple and CBM 64 most widely (though with the various interfaces now available there's no reason why Spectrum owners shouldn't consider them also). Stick power is yours with *The Boss* for £13.00 — this squares up looks-and quality-wise with the Pro Stick or Spectravision II. Move on up to the *Red Ball* stick on shape, action, weight and sensitivity — 8-way directions are yours for £10 more. Those who treat joysticks as precision instruments, like forceps, will approve of the choice represented by the *3-way Joystick* at £25. Three changeable handles come supplied — a mini-baseball bat and two contoured shapes.

In the US, Wico is pretty much a connoisseur's stick. Now that their prices are significantly lower than when they first arrived, others can experience them too.

NB: Watch out for
Upcoming BIG K Controller Review



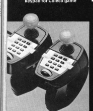
ENTER THE FUN GLOVE

Surely the all-time prize for Input Device Gross-out must be given — no contenders — to CBS-Coleco, whose Super Action Hand Controllers are easily the most baroque widgets yet.

They resemble the boxing-gloves of a robot: great metal and plastic gauntlets that almost enclose your fist. On top: keypad for Coleco game selection combinations; ball-handled stick with short stem and thankfully easier action than on the Coleco game system. There is also a mysterious white knurled plastic wheel that tracks a cursor in certain Coleco games.

Underneath the fingers: four separate multicoloured triggers, one for each digit. Again, these have special applications.

Though lurid and gauche to the point of insanity to look at, these items — like so much Mickey Mouse American engineering — actually work very well. The ball stick is positive and smooth, almost WICO standard.



ELECTRON DIGITAL

Electron users (hi!) know that while they have a good BBC jr in many ways, they also have a machine frustratingly difficult to expand. Acorn presumably intended all along that puterists wishing to expand would naturally go for Big Bro', but that's not the way people think.

That aside, companies (including, it must be said, Acron) have been quietly working on the not inconsiderable task of making the Electron even mildly expandable. Yea, even unto the point of a decent joystick.

Digital sticks run not on the Acorn Electron. It's either Analogue or the keyboard. The range of Atari-compatible sticks (i.e. the best and the most) are or have been unavailable. Until — you guessed it — now.

FBC Systems of Derbys (you know them as First Byte) have now produced a little interpretive bit of hardware that lets Wicos, Pro-Sticks, Spectra IIs, etc, all talk to Electrons. We guess it goes into The

Each month a new slew of bizarre and beautiful bolt-ons arrives at the Tower of Power. Here's a selection — from the Neat 'n Needful to the Numbingly Naff.

AQUARIUS 4-COLOR PRINTER
PAPER
COLOR

AQUARIUS SWIM IN SPECTRUM WATERS WITH NEW PLOTTER

When Mattel's electronics division nosedived into the fertilizer last Christmas many folks assumed that was the end of both the Intellivsion games system and the budget Aquarius computer.

But Aquarius lives! 16K RAM expansions and more software (including "small business" packages as well as the LOGO language) have yanked it back even as the lid of the tomb slammeth; today, it doesn't exactly sell in hosts, and probably never will, but the machine has now generated a series of tasty peripherals, *all of which are Spectrum-compatible.* The first of these to be revealed is the Aquarius 4-colour printer/plotter.

It's a buff-and-dark-blue slimline package about the size of a box of 50 cigars. It takes the usual 40-column roll of paper (any paper, ZX owners), prints text and excellent graphics in (you guessed it) four colours, and possesses its own remarkably comprehensive character set. All of this can be generated by either an Aquarius computer or — and this is much more of a prospect — Sinclair Spectrums running Interface I.

Connection with the host Aquarius is via a miniature-jack serial cable. On power-up (which must be done before switching on the computer), the printer gears up with a whinge or two, then raps out four filled circles, each in a different colour. The pens, by the way, are inserted and removed with fantastic ease, and are about the size of .22 bullets. By holding down the PAPER fascia button while switching on the Aquarius can be made to generate its complete character set in either 40-or 80-column measure. The superb quality of the latter, highly-miniaturised print is breathtaking for a machine of this price.

It operates in three modes: text only; mixed text and graphics (with alternate character set); and graphics alone. And it can function in the normal way (albeit wasted) as a simple program lister (the LLIST command), text reproducer (via LPRINT); or you can invoke a couple of protocols and convert it to a plotter.

A printer — possibly after a disc drive — is most people's choice of chief peripheral. Four-colour printer technology is now, in its upper reaches, a fine and expensive art; it was inevitable that before long someone would produce an example of the same technology to suit the "budget" end of the market. In the UK, this means Spectrum, and the fact that the Aquarius Printer/Plotter runs on Spectrum (via an RS232 lead) must make it a serious choice.

DONGLE

User Port, as it were. Its price is £24.95.

Unhappily Acorn have also chosen this moment to unveil a range of Electron talk-throughs. For £59.00 said lucky Electron people can get yourselves tooled up with Plus-1, an all-purpose expansion box.

All together in the unit are a centronics printer port, two ROM slots, and a single analogue joystick port. So you still have to use the First Byte converter if you want to use decent sticks.

FIRST BYTE
A Genuine First Byte Add-on

WONDER WIDGETS

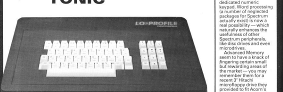
CONTINUED FROM PAGE 61

THIS SLIMLINE IS A TONIC

Spectrum owners never tire of bitching about their keyboards and who's to blame them? For this reason there has always been a substantial amount of interest in conversions (upwards, of course).

Newest to emerge in this field are Advanced Memory Systems, who offer a low-profile full-stroke conversion kit for £49.95. Among thoughtful upgrades to the Sinclair layout are the provision of a proper space bar and a dedicated numeric keypad. Word processing (a number of neglected packages for Spectrum actually exist) is now a real possibility — which naturally enhances the usefulness of other Spectrum peripherals, like disc drives and even microdrives.

Advanced Memory seem to have a knack of fingering certain small but rewarding areas of the market — you may remember them for a recent 3" Hitachi microfloppy drive they provided to fit Acorn's BBC-DOS.



NAFFWARE CORNER

We had to get this one in.

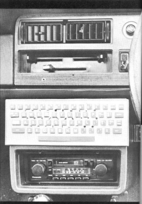
If we had an award for the looniest widget of the month (perhaps we should?) this month's grand prix would surely go to makers of the great Atari 400 Stick-on Rubber Keyboard.

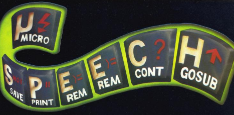
Actually, it works. The notorious flat keyboard of the 16K 400 (Atari's ugliest machine yet) is in fact pretty sensitive, and the rubber keyboard when stuck in place actually softens the tactile impact, though you still can't really touch type. And yes, Atari 400 owners might well go for it in huge crowds, practically beating in Filesixty's doors in their desire to get keyboarded up.

What strikes us most, though, here at Big K, is the aesthetic ludicrousness of the thing. Rubber! (Heave, spew.) Stick-on! (Tacky.) For the Atari 400! (Obsolescent if not obsolete.) NO, our sense of human dignity would simply not let us use this device for the purpose intended.

It is when it is regarded as an ART object that this splendid piece of nonsense comes into its own. To add Pose Power to your motor, there's nothing like it. BIG K Art Editor Ian Stead found it a home affixed to the all-metal dash of his Cortina. There, it serves no practical function whatever, but hitch-hikers are awestruck and other motorists, assuming it to be the ultimate trip computer, ply Ian with questions. He is developing quite a good line of patter on the subject.

Can we all have one, please?





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  (it says any word you want it to say)
- µ EXCLUSIVE TECHNOLOGY MEANS ALL SOUND IS NOW PUT THROUGH YOUR TV
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..................................ARCADIA..Mushroom Mania......PSS..Blade Alley......MR MICRO..Crazy Golf..Punchy..Harlequin......DkTRONICS..Maziacs......................

(some of these games are new versions of original programs)

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fantasy
SOFTWARE

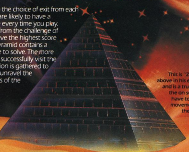
Bob Hamilton's best selling Spectrum game has been beautifully converted for the Commodore 64 by John White with many additional features fully utilising the extra capabilities of this machine. The Pyramid contains 120 chambers on 15 levels. In order to get from one chamber to another you must fight off the indigenous aliens to collect an energised crystal which will neutralize the force field guarding the two exits. The Pyramid is defended by a total of 120 different beautifully animated aliens (more than any other video game in history!), one for every chamber and each with a unique attack pattern. They manifest themselves in the most amazingly diverse and peculiar forms from the squirting soda syphons to the extra-terrestrial tweezers and a whole host of entities defying rational description. You will have great fun inventing your own nicknames.

You proceed to explore the Pyramid from top to bottom with the difficulty increasing with the depth of level as the attack patterns get more complex and the aliens become intelligent.

Depending on the choice of exit from each chamber you are likely to have a different game every time you play.

Apart from the challenge of trying to achieve the highest score possible the Pyramid contains a number puzzle to solve. The more chambers you successfully visit the more information is gathered to enable you to unravel the secret numbers of the Pyramid.

This is "ZIGGY". He is shown above in his exploratory capsule and is a true representation of the on screen graphics. You have total control over his movements as you explore the many chambers of "THE PYRAMID".



THE PYRAMID

For Commodore 64 and 48K Spectrum

FANTASY SOFTWARE is available from W.H. SMITHS, JOHN MENZIES, BOOTS, LASKYS, GREENS, RUMBELOWS, SPECTRUM GROUP and all other good software retailers.

The Pyramid at £6.50 for Commodore 64K and at £5.50 for the Spectrum 48K from

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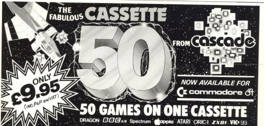

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BK 8/84

What's this? A computer game that requires a pencil and paper? Your mind will ***BOGGLE!*** *What is more, two can play. Just check the letters on the screen and make up as many words as you can from them within the time limit — the more letters in your words the more you score. So type in this up to the moment version of a family favourite and put your brain cells into high gear. Full instructions are given in the program.*

ROCN
POWC
LUIN
ANES
B
O

by J. WINCHESTER
for
ZX81

```
   1 REM SK? GOSUB ?£RND:(▘CHR$ ▘
GOSUB ▛TAN
   2 REM £RND/K?▘CHR$ ▘/ GOSUB
▛TAN
   3 POKE 16516,117
   4 POKE 16518,91
   5 POKE 16539,117
   6 LET STO=16534
   7 LET RET=16514
   8 GOSUB 700
   9 PRINT AT 3,11;"▀▀▀▀▀▀▀▀▀▀",
TAB 11;"█ BOGGLE █",TAB 11;"▄▄▄▄
▄▄▄▄▄▄"
  10 PRINT AT 10,1;"PLEASE WAIT
A WHILE AS I MUST",,,TAB 6;"WORK
 OUT THE BOARD"
  11 PRINT AT 14,1;"THE SCREEN W
ILL GO BLANK FOR",,,TAB 6;"ABOUT
 HALF A MINUTE"
  12 PRINT AT 18,7;"▀▀▀▀▀▀▀▀▀▀▀▀▀
▀▀▀▀▀",TAB 7;"█ BY J.WINCHESTE
R █",TAB 7;"▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄"
  14 FOR P=1 TO 300
  15 NEXT P
  17 CLS
  18 FAST
  19 FOR P=0 TO 20
  20 PRINT AT P,0;"█"
  30 PRINT AT P,5;"█"
  40 PRINT AT P,10;"█"
  50 PRINT AT P,15;"█"
  55 PRINT AT P,20;"█"
  60 NEXT P
  62 PRINT AT 1,22;"▛▀▀▀▀▀▀▀▜"
  63 PRINT TAB 22;"▌       ▐"
  64 PRINT TAB 22;"▌       ▐"
  65 PRINT TAB 22;"▌ BOGGLE▐"
  66 PRINT TAB 22;"▌       ▐"
  67 PRINT TAB 22;"▌       ▐"
  68 PRINT TAB 22;"▙▄▄▄▄▄▄▄▟"
  70 LET P$="▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒
▒▒"
  80 PRINT AT 0,0;P$;AT 5,0;P$;A
T 10,0;P$;AT 15,0;P$;AT 20,0;P$
 100 DIM A$(16,6)
 105 LET A$(1)="YFEHIE"
 107 LET A$(2)="LUKEYG"
 109 LET A$(3)="SAHOMR"
 111 LET A$(4)="GURILW"
 113 LET A$(5)="TUSEPL"
 114 LET A$(6)="ROMAHS"
 115 LET A$(7)="YLTBAI"
 117 LET A$(8)="NEDAVZ"
 119 LET A$(9)="AMOQJB"
 121 LET A$(10)="RCLSAE"
 123 LET A$(11)="DONUTK"
 125 LET A$(12)="FIROBX"
 126 LET Y=41
 127 LET A$(13)="DONESW"
 129 LET A$(14)="INEGVT"
 131 LET A$(15)="TOCAAI"
 132 LET A$(16)="MCDPAE"
 134 DIM D$(16)
 135 LET X=2
 136 LET Y=42
 140 DIM C$(16,2)
 142 FOR P=1 TO 16
 143 LET D$(P)="0"
 144 NEXT P
 145 FOR D=1 TO 16
 146 LET A=INT (RND*16)+1
 148 IF D$(A)="1" THEN GOTO 146
 150 LET C$(D)=STR$ A
 151 LET D$(A)="1"
 152 NEXT D
 200 FOR P=1 TO 16
 210 LET R$=A$(VAL C$(P,1 TO 2),
INT (RND*6)+1)
 215 IF R$="Q" THEN PRINT AT 23-
Y/2,X/2+2;"U"
 260 LET A=7680+8*CODE R$
 270 FOR C=A TO A+7
 280 LET B=PEEK C
 290 IF C/2=INT C/2 THEN LET Y=Y
-1
 300 FOR N=1 TO 8
 310 LET B=2*(B-256*INT (B/256))
 320 IF B>=256 THEN PLOT X+N-1,Y
 330 NEXT N
 380 NEXT C
 400 LET X=X+10
```

```
 410 LET Y=Y+8
 415 IF X>40 THEN LET Y=Y-10
 420 IF X>40 THEN LET X=2
 450 NEXT P
 451 SLOW
 500 LET KO=USR STO
 505 FOR P=1 TO 64
 510 FOR O=1 TO 43
 515 NEXT O
 520 PLOT 54+9*SIN (P/32*PI),10+
9*COS (P/32*PI)
 540 NEXT P
 550 CLS
 560 PRINT AT 4,6;"█▀▀█▀█▀▌ █
██";TAB 6;"  █ █ █ █▐ █"
 570 PRINT TAB 6;"  █ █ █ ▐ █
█";TAB 6;" █  █ ▐ █  █"
 580 PRINT TAB 6;"  █ ▀ ▀    █
█"
 590 PRINT ,,TAB 11;"█  █ ████"
;TAB 11;"█  ██ █"
 600 PRINT TAB 11;"▒  ▒ ████";T
AB 11;"▒  ▒▒"
 610 PRINT TAB 11;" ███  █"
 620 FOR P=1 TO 175
 630 NEXT P
 640 LET KO=USR RET
 650 PRINT AT 10,22;"PRESS ANY";
```

```
TAB 22;"KEY TO";TAB 22;"RESTART"
 655 IF INKEY$="" THEN GOTO 655
 656 FAST
 680 GOTO 16
 700 PRINT AT 3,10;"B O G G L E"
 705 PRINT AT 8,7;"(INSTRUCTIONS
? Y/N)"
 710 INPUT S$
 720 CLS
 730 IF S$="N" THEN RETURN
 735 PRINT "BOGGLE IS FOR 2 OR M
ORE PEOPLE."
 740 PRINT "I WILL PRINT UP A 4
BY 4 GRID OF"
 745 PRINT "LETTERS. YOU HAVE A
TIME LIMIT"
 750 PRINT "(SHOWN BY THE CLOCK)
,IN WHICH"
 755 PRINT "YOU MUST FIND AS MAN
Y HIDDEN "
 760 PRINT "WORDS AS YOU CAN  (M
INIMUM OF 3"
 765 PRINT "LETTERS).   THE LETT
ERS MUST"
 770 PRINT "BE TOUCHING EACH OTH
ER ON THE"
 775 PRINT "BOARD. EG TO GET ""H
ELLO"" THE H"
 780 PRINT "MUST EITHER BE ABOVE
,BELOW, OR"
 785 PRINT "BESIDE THE E(A DIAGO
NAL LINK UP"
 790 PRINT "IS VALID), THE L MUS
T SIMILARLY "
 800 PRINT "LINK UP WITH THE E,
ALTHOUGH THE"
 805 PRINT "L NEED NOT LINK WITH
 THE H."
 810 PRINT "THE NEXT L CANNOT BE
 THE SAME L"
 815 PRINT "AS BEFORE, NOR CAN A
NY LETTERS"
 817 PRINT "BE REPEATED"
 820 PRINT "IN THE SAME WORD UNL
ESS THEY"
 825 PRINT "GENUINELY APPEAR TWI
CE. FINALLY"
 830 PRINT "THE O MUST LINK WITH
 THE L"
 835 PRINT "TO GIVE ""HELLO""."
 836 PRINT AT 21,0;"PRESS A KEY
TO GO ON"
 837 IF INKEY$="" THEN GOTO 837
 838 CLS
 840 PRINT "WHEN YOUR TIME IS FI
NISHED( I "
 845 PRINT "WILL LET YOU KNOW),
EACH PLAYER"
 850 PRINT "READS ALOUD THE WORD
S HE""S GOT."
 855 PRINT "IF ANY ONE ELSE ALSO
 HAS THAT"
 860 PRINT "WORD THEN EVERYONE C
ROSSES THAT"
 865 PRINT "WORD FROM THEIR LIST
S."
 870 PRINT "FOR ANY WORD NOBODY
ELSE HAS"
 875 PRINT "ALSO GOT THAT PLAYER
 RECIEVES A"
 880 PRINT "SCORE AS FOLLOWS"
 890 PRINT TAB 3;"3,4 LETTERS  =1
"
 900 PRINT TAB 3;"5 LETTERS    =2
"
1000 PRINT TAB 3;"6 LETTERS    =3
"
1005 PRINT TAB 3;"7 LETTERS    =5
"
1010 PRINT TAB 3;"8+LETTERS    =1
1"
1050 PRINT "USUALLY AT LEAST 4 B
OARDS ARE"
1055 PRINT "PLAYED, WITH THE WIN
NER HAVING"
1060 PRINT "THE LARGEST TOTAL OF
 POINTS AT"
1070 PRINT "THE END."
1080 PRINT "PS. A Q COUNTS AS A
QU AND AS"
1090 PRINT "2 LETTERS IF INCLUDE
D IN A WORD"
1100 PRINT AT 20,0;"PRESS A KEY
TO PLAY THE GAME"
1105 IF INKEY$="" THEN GOTO 1105
1110 CLS
1120 RETURN
```

```
  10█PRINT AT 10,1;"PLEASE WAIT
A WHILE AS I MUST",,,TAB 6;"WORK
 OUT THE BOARD"
  11 PRINT AT 14,1;"THE SCREEN W
ILL GO BLANK FOR",,,TAB 6;"ABOUT
 HALF A MINUTE"
  12 PRINT AT 18,7;"█▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀
▀▀▀▀▀▀▀▀▀█",TAB 7;"█ BY J.WINCHESTE
R █",TAB 7;"█▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄█"
  14 FOR P=1 TO 300
  15 NEXT P
  17 CLS
  18 FAST
  19 FOR P=0 TO 20
  20 PRINT AT P,0;"▓"
  30 PRINT AT P,5;"▓"
  40 PRINT AT P,10;"▓"
  50 PRINT AT P,15;"▓"
  55 PRINT AT P,20;"▓"
```

```
 600█PRINT TAB 11;"█   █ █████";T
AB 11;"█   █ █"
 610 PRINT TAB 11;" ███  █"
 620 FOR P=1 TO 175
 630 NEXT P
 640 LET KO=USR RET
 650 PRINT AT 10,22;"PRESS ANY";
TAB 22;"KEY TO";TAB 22;"RESTART"
 655 IF INKEY$="" THEN GOTO 655
 656 FAST
```

Don't Just Sit There Move!

SINCLAIR'S ADVERTISING blurb proudly proclaims the Spectrum as a High Resolution Micro offering a definition of 256 × 192. Even the small print doesn't tell you that you can only PRINT in a rigidly defined grid of 32 × 22 character squares.

Okay, so you can use *Plot* to produce static pictures with the full resolution — but that's what they are, STATIC and uninteresting, at least from a games viewpoint. As for the alternatives. Well, what alternatives? You could conceivably construct the characters by plotting certain adjacent pixels on the screen but that is appallingly slow. You could of course forget that you've got a high resolution machine altogether and opt for low resolution character movement in any games you write and watch characters make enormous great jumps as they are transported around the screen. (A lot of very good, mainly BASIC, games have been written in this way). Mind you, if you forget about the High-Res you might as well forget all about colour, sound and all the rest of the associated paraphernalia and replace your Spectrum with a slightly less graphically advanced system — perhaps a ZX80 and a prehistoric telly!

Fortunately the problem is not insurmountable and can be solved with a short program although it does require us to dabble in that dreaded language, machine code. A short machine code program to perform such a task is shown in Listing 1. The machine code is tucked away above RAMTOP well away from the danger of overwriting by BASIC. Since the address of RAMTOP differs on the 16K machine from the 48K it is necessary to have two versions of the program; one for each memory size. If you own a 16K computer then type in listing 2 rather than the first listing. All the program does is to poke the machine code into memory. When you've finished keyboard bashing you're ready to RUN it. The program incorporates a checksum to verify the accuracy of the data, so if you've made a mistake it will tell you so and give you an idea of where to look for it. Once the program has successfully RUN you can save your machine code on tape using the commands below:

For 48K owners — SAVE "Hires Prnt" CODE 65116,252
For 16K owners — SAVE "Hires Prnt" CODE 32348,252

You can reload the program at any time by using:

For 48K owners — CLEAR 65115: LOAD ""CODE
For 16K owners — CLEAR 32347: LOAD ""CODE

It's a good idea to save and verify a couple of times in case any devastating calamity should befall your first recording. All that the machine code does is the equivalent of poking a character onto the screen but at a much more respectable rate than BASIC can ever hope to do. The machine code also has to do a bit of fiddling about with binary numbers when a graphic straddles two or more character squares.

To print a character using this routine requires 3 pokes followed by a machine code USR call, not surprisingly. The locations which are poked differs between the two versions of the program so remember to type in the right ones or you could find your machine crashing on you. The first location defines the x coordinate of the position where you want the character you wish to print. To save any hassle with pokes and USR statements it's a good idea to have a small general purpose subroutine which you can call whenever you want to print a Hi-Res character. Such a subroutine is listed below:

For 16K Machines:

```
9900 POKE 32350,CODE
a$
9910 POKE 32348,x:
POKE 32349,y
9920 RANDOMIZE USR
32351
9930 RETURN
```

For 48K Machines:

```
9900 POKE 65118,CODE
a$
9910 POKE 65116,x:
POKE 65117,y
9920 RANDOMIZE USR
65119
9930 RETURN
```

When the subroutine is called, using 'GO SUB 9900', the variables a$, x and y must hold certain parameters. A$ holds the character that is to be printed. The program allows you to print any of the basic character set (with codes 32-127) plus user definable characters (with codes 144-164) but you're not allowed to print tokens or the graphics characters available on the top row of the keyboard when in graphics mode.

X holds the x co-ordinate (0-255) position of the top left hand corner of the character to be printed while y, quite predictably, holds the y co-ordinate (0-175) of that point. Note that, unlike PLOT and CIRCLE etc. the y co-ordinate is numbered from the top rather than from the bottom of the screen so that (0,0) is at the top left rather than at the bottom left hand corner of the screen. So for instance 'LET a$="A": LET x=128: LET y=88: GOSUB 9900' prints the letter A slap bang in the middle of the screen. Try it and see. The below listing:

```
10 LET y=88
20 FOR a=1 TO 255
30 LET x=a-1: LET a$="
": REM Space
40 GOSUB 9900
50 LET x=a: LET a$="O"
60 GOSUB 9900
70 NEXT a
80 STOP
9900 (The Hi-Res Printing
routine)
```

will smoothly move the letter O across the screen from left to right. Notice that before a new 'O' can be printed the old one has to be erased by overprinting it with a space. That awful flicker is a result of the fact that the 'O' is completely absent from the screen for a short period just after the old version has been overprinted. In a later article I will explain how to overcome this problem (to a large extent). If you add 'STEP 2' to the end of line 20 then the movement will be much faster although not quite as smooth. You can arrange the x and y co-ordinates so that the movement is a little more interesting. You can use some of the computer's trig and other mathematical functions to produce some fascinating movement patterns. An example is given in the following listing:

```
10 LET x=128: LET y=88
20 FOR z=0 TO 359
30 LET oldx=x: LET
oldy=y
40 LET r=87*SIN
(10*z/180*PI)
50 LET xx=128+r*COS
(z/180*PI)
60 LET yy=88+r*SIN
(z/180*PI)
70 LET x=oldx: LET
y=oldy: LET a$=" ":
REM Space
80 GOSUB 9900
90 LET x=xx: LET y=yy:
LET a$="O"
100 GOSUB 9900
110 NEXT z
120 STOP
9900 (Hi-res Printing
routine)
```

Listing 3 illustrates another aspect of movement — acceleration and deceleration. You can move a dot around the screen using the cursor keys. Upon pressing key 'm' the O, initially positioned at the screen's centre, moves towards the dot. Its velocity is not constant; as the O nears the dot its speed gradually decreases. The hard work of the program is done by lines 1000 and 1010 which basically work out what one tenth of the distance is between the dot and the 'O' and moves the 'O' that distance towards the dot. As the 'O' nears the dot the jumps gradually get smaller so that the 'O' moves more slowly.

Listing 3:-

```
  10 LET xc=65116: REM 32348 for 16K
  20 LET yc=xc+1: LET char=xc+2
  30 LET mc=xc+3
  40 LET dx=128: LET dy=88: GO SUB 2000
  50 LET px=128: LET py=88: PLOT px,py
  60 LET a$=INKEY$
  70 IF a$="" THEN GO TO 60
  80 IF a$="m" OR a$="M" THEN GO SUB 50
0
  90 LET oldx=px: LET oldy=py: IF a$="5
" THEN LET px=px-(px>0)
 100 IF a$="7" THEN LET py=py+(py<175)
 110 IF a$="6" THEN LET py=py-(py>0)
 120 IF a$="8" THEN LET px=px+(px<255)
 130 PLOT OVER 1;oldx,oldy
 140 PLOT px,py
 150 GO TO 60
 500 LET apx=px-4: IF apx<0 THEN LET ap
x=0
 510 LET apy=py+4: IF apy>175 THEN LET
apy=175
1000 LET dx=dx+(apx-dx)/10
1010 LET dy=dy+(apy-dy)/10
1020 LET adx=INT (dx+.5)
1030 LET ady=INT (dy+.5)
1040 GO SUB 2000
1050 IF apx=adx AND apy=ady THEN RETURN
1060 GO TO 1000
2000 POKE Char,CODE " ": REM Space
2010 PRINT ;: RANDOMIZE USR mc
2020 POKE xc,dx: POKE yc,175-dy
2030 POKEChar,CODE "O"
2040 RANDOMISE USR mc
2050 RETURN
```

Take particular care in typing in these listings, particularly the M/C bits in the data sections.

Listing 1:-

```
  10 REM Hi-res Printing Routine
  20 REM   By  Richard Taylor
  30 REM
  40 CLEAR 65115
  50 LET a=65116
  70 FOR l=1 TO 4
  80 LET t=0: READ v,a$
  90 IF LEN a$/2<>INT (LEN a$/2)
 THEN GO TO 200
 100 FOR c=1 TO LEN a$ STEP 2
 110 LET x=CODE a$(c)-48-7*(a$(c
)>="A")
 120 LET y=CODE a$(c+1)-48-7*(a$
(c+1)>="A")
 130 POKE a,16*x+y
 140 LET t=t+16*x+y
 150 LET a=a+1
 160 NEXT c
 180 IF v<>t THEN GO TO 200
 190 NEXT l: PRINT "Data OK - no
w SAVE": STOP
 200 PRINT "ERROR in line ";990+
l*10
 210 STOP
1000 DATA 8322,"000000FDCB76863A
5EFEFE20D8FE803006ED5B365C180AD6
90D8FE15D0ED5B7B5C6F260029292919
EBED4B5CFE78FEB0D0CDB122C4E4FE3A
5DFE473EB090FE08"
1010 DATA 6484,"38023E0847C5CDF8
FEFDCB764620061A772313101E1ADD44
0E00CB27CB1110FA47DD7DA6B1771323
7DE61F2806DD7D2FA6B0772B247CE607
200A7DC6206F3F9F"
1020 DATA 8907,"E6F88467C110BEC9
FDCB76C64F3E0891DD67473EFFCB2710
FCDD6FC9E57C0F0F0FE603F65867D5ED
5B8F5C7EABA2ABFDCB57762808E6C7CB
572002EE38FDCB57"
1030 DATA 7461,"662808E6F8CB6F20
02EE0777FDCB76462827237DE61F2821
7EABA2ABFDCB57762808E6C7CB572002
EE38FDCB57662808E6F8CB6F2002EE07
77D1E1C9"
```

Listing 2:-

```
  10 REM Hi-res Printing Routine
  20 REM   By  Richard Taylor
  30 REM
  40 CLEAR 32347
  50 LET a=32348
  70 FOR l=1 TO 4
  80 LET t=0: READ v,a$
  90 IF LEN a$/2<>INT (LEN a$/2)
 THEN GO TO 200
 100 FOR c=1 TO LEN a$ STEP 2
 110 LET x=CODE a$(c)-48-7*(a$(c
)>="A")
 120 LET y=CODE a$(c+1)-48-7*(a$
(c+1)>="A")
 130 POKE a,16*x+y
 140 LET t=t+16*x+y
 150 LET a=a+1
 160 NEXT c
 180 IF v<>t THEN GO TO 200
 190 NEXT l: PRINT "Data OK - No
w SAVE": STOP
 200 PRINT "ERROR in line ";990+
l*10
 210 STOP
1000 DATA 7810,"000000FDCB76863A
5E7EFE20D8FE803006ED5B365C180AD6
90D8FE15D0ED5B7B5C6F260029292919
EBED4B5C7E78FEB0D0CDB122C4E47E3A
5D7E473EB090FE08"
1010 DATA 6356,"38023E0847C5CDF8
7EFDCB764620061A772313101E1ADD44
0E00CB27CB1110FA47DD7DA6B1771323
7DE61F2806DD7D2FA6B0772B247CE607
200A7DC6206F3F9F"
1020 DATA 8907,"E6F88467C110BEC9
FDCB76C64F3E0891DD67473EFFCB2710
FCDD6FC9E57C0F0F0FE603F65867D5ED
5B8F5C7EABA2ABFDCB57762808E6C7CB
572002EE38FDCB57"
1030 DATA 7461,"662808E6F8CB6F20
02EE0777FDCB76462827237DE61F2821
7EABA2ABFDCB57762808E6C7CB572002
EE38FDCB57662808E6F8CB6F2002EE07
77D1F1C9"
```

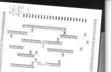
The result: there it is!

There it goes!

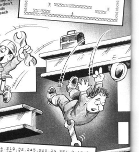
It's gone! Wanna see it again?

platform leaper

by RICHARD WRIGHT for SPECTRUM



Your goal is the finishing platform at the top. To reach it leap from one platform to another but whatever you do don't touch the droids patrolling each sector.



```
   1 DEF FN j(X,y)=(64+7*INT (X/
8)+X/8)*256+y
   5 RESTORE   PAPER 0: INK 7: B
ORDER 0: CLS
  10 FOR n=23315 TO 23399
  20 READ a: POKE n,a: NEXT n
  30 FOR n=USR "a" TO USR "e"+7:
 READ a: POKE n,a: NEXT n
  31 LET fr=1: LET li=3: LET sh=
0: LET t=23
  32 LET sh=sh+1
  33 PRINT INK 5;"  LIVES:";li:
PRINT "  LEVEL  ";sh
  35 FOR n=3 TO 21: PRINT CHR$ 1
45;TAB 31;CHR$ 145: NEXT n
  38 FOR n=23295 TO 23314: POKE
n,INT (RND*2): NEXT n
  40 FOR n=1 TO 12: READ X: READ
 y: READ z: PRINT INK RND*5+3;AT
 X,y;"▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽
▽▽▽▽▽▽"( TO z): NEXT n
  45 PRINT AT 5,8; FLASH 1; INK
6;"▽▽▽▽▽▽▽▽▽▽▽▽▽▽"
  50 FOR n=1 TO 18: READ X: READ
 y: PRINT AT X,y;CHR$ 144: NEXT
n
  70 LET X=20: LET y=16: LET a$=
CHR$ 146
  75 LET st=0: LET jp=0: LET fa=
0
  76 PRINT AT 2,2; INK 6;"TIME:"
;"▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌▌"( TO
t);" "
  78 LET t=t-.05: IF t<1 THEN GO
 TO 1200
  80 IF jp THEN GO TO 200
  85 IF fa THEN GO TO 300
  87 LET fr=1-fr: IF fr=1 THEN I
F NOT USR 23317 THEN GO TO 1000
  90 IF NOT jp AND NOT fa THEN L
ET X$=INKEY$: IF X$<>"" THEN GO
TO 400
  95 IF X=4 THEN GO TO 1500
 100 LET a$=CHR$ 146
 110 PRINT AT X,y; INK 7;a$
 120 GO TO 76
 200 IF st=0 THEN LET jd=(a$=CHR
$ 148)-(a$=CHR$ 147)
 201 BEEP .005,st+15
 205 LET st=st+1: IF st=4 THEN L
ET st=0: LET jp=0: LET fa=1: GO
TO 87
 210 LET X1=0: LET y1=0: IF st=1
 THEN LET X1=-1
 215 IF st=2 THEN LET y1=jd: LET
 X1=-1
 220 IF st=3 THEN LET y1=jd
 230 LET m=PEEK FN j(X+X1,y+y1)
 240 IF m=219 THEN GO TO 1000
 250 IF m<>0 THEN LET st=3: GO T
O 205
 260 PRINT AT X,y;" ": LET X=X+X
1: LET y=y+y1: PRINT AT X,y;a$:
GO TO 87
 300 LET m=PEEK FN j(X+1,y)
 305 BEEP .005,X+2
 310 IF m=219 THEN GO TO 1000
 320 IF m<>0 THEN LET fa=0: GO T
O 87
 330 PRINT AT X,y;" ": LET X=X+1
: PRINT AT X,y;a$: GO TO 87
 400 IF CODE X$>198 THEN LET jp=
1: GO TO 80
 402 BEEP .005,30
 405 LET m=PEEK FN j(X+1,y): IF
m=0 THEN LET fa=1: GO TO 87
 410 IF X$="w" THEN GO TO 460
 420 IF X$<>"q" THEN GO TO 100
 430 LET m=PEEK FN j(X,y-1): IF
m=219 THEN GO TO 1000
 435 IF m<>0 THEN GO TO 100
 440 PRINT AT X,y;" ": LET a$=CH
R$ 147: LET y=y-1: IF PEEK FN j(
X+1,y)=0 THEN LET fa=1
 450 GO TO 110
 460 LET m=PEEK FN j(X,y+1): IF
m=219 THEN GO TO 1000
 465 IF m<>0 THEN GO TO 100
 470 PRINT AT X,y;" ": LET a$=CH
R$ 148: LET y=y+1: IF PEEK EN j(
X+1,y)=0 THEN LET fa=1
 480 GO TO 110
 500 DATA 209,201,17,0,91,33,64,
64,213,35,124,254,88,40,241,126,
254,219,32,245,229,26,254,2,40,2
,35,35,43,126,254,0,40,18,254,24
,32,5,1,1,0,24,9,26,238,1,18
 600 DATA 225,209,19,24,212,225,
26,254,1,32,5,17,1,0,24,3,17,255
,255,229,14,8,126,54,0,25,119,17,
5,237,82,36,13,32,244,225,25,24,
219
 700 DATA 219,126,90,126,24,60,1
02,195
 710 DATA 255,195,102,60,24,255
0,0
 720 DATA 24,24,60,90,153,60,36,
102
 730 DATA 24,152,255,25,60,36,66
,193
 740 DATA 24,25,255,152,60,36,66
,131
 800 DATA 21,0,32,20,3,6,18,10,1
3,19,24,4,16,4,5,15,13,8,10,6,6,
11,16,9,11,3,5,9,7,14,7,2,7,7,20
,6
 900 DATA 5,2,5,26,6,4,6,15,6,27
,8,4,8,13,8,26,10,6,10,21,12,5,1
2,15,12,24,14,13,14,26,15,8,18,5
,18,27
1000 PRINT AT X,y; FLASH 1: INK
2;CHR$ 146
1005 RESTORE 800
1010 FOR n=1 TO 30: BEEP .02,n:
NEXT n
1020 PAUSE 50: CLS : LET t=23: L
ET li=li-1: IF li THEN GO TO 33
1030 PRINT AT 10,10; INK 6; FLAS
H 1;"GAME OVER"
1040 PRINT AT 18,2; INK 4; FLASH
 1;"PRESS ANY KEY FOR A NEW GAME
"
1050 IF INKEY$="" THEN GO TO 105
0
1060 CLS : GO TO 31
1200 CLS : PRINT AT 10,11; FLASH
 1; INK 6;"TIME UP": GO TO 1005
1500 IF y<6 OR y>20 THEN GO TO 1
00
1510 FOR n=1 TO 60: NEXT n: CLS
: PRINT AT 10,10; INK 6; FLASH 1
;"WELL DONE"
1520 FOR n=62 TO 1 STEP -1: BEEP
 .002,n: NEXT n
1530 PAUSE 50: RESTORE 800: LET
t=23: CLS : GO TO 32
```

Q — left W — right SYMBOL SHIFT — jump

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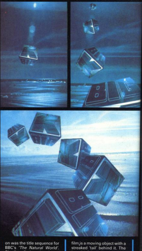
BK 8/84

THE IMAGE

TV Effects machines such as Quantel's Paintbox and Mirage are as far above common-or-garden home micros as a Lamborghini is to a dustcart. It seems there is literally nothing these devices can't achieve by way of graphics and image manipulation. They are truly the State of the Art. But which art? KIM ALDIS reports.



THREE O-CLOCK in the morning and the phone was ringing. I crawled out of bed and fell over the cat. This had better be good. It was Big K. They needed information — fast. Subject — computerised special effects in film and video. I poured myself a coffee and thought carefully. This was going to be a tough one. Reaching into a drawer I pulled out my book of contacts and came up with two names. The Moving Picture Company, one of London's biggest video companies who also had a large film special effects unit; and The Digital Picture Company who specialise in solid computer graphics. State of the art stuff, this. It was going to be good.

First stop was The Moving Picture Company where I met Maggie Allison, the production manager.

MOTION CONTROL

We approached a small black door at the end of a dimly lit corridor. 'This is Motion Control' Maggie said. We walked in and were confronted by something that looked like Stevenson's Rocket left in the clutches of a berserk chimp with a Meccano set.

'Hello' it said. I retrieved my jaw from the floor and pushed it firmly back onto the bottom of my face. Obviously the situation needed reassessing. Then a small ginger head poked through a massive tangle of wires like an orange on a plate of spaghetti. 'Hi' said the head. 'This is Peter Truckel' said Maggie, 'he's in charge here'. Maggie asked Pete for a demonstration and he walked over to the control desk. Hands flew across the keyboard, producing a totally incomprehensible array of figures on the plasma display. Suddenly, with no warning, the beast flew along its tracks, a camera on the front gyrating crazily. Pete pointed to a monitor screen above the control desk and we watched a spaceship fly in from the distance, do a victory roll and then disappear out of the top of the screen. A quick glance down the end of the studio revealed that the spaceship was in fact a model, the impression of movement being given solely by movement of the camera on the Rig.

So what is Motion Control? Remember Star Wars? All those X-Wing fighters and Ty-fighters in eternal conflict? They were all models filmed on a Motion Control rig, similar to this one, in the States. Essentially it's a robot camera which can move in ways that would make the average cameraman go green.

Basically this rig is a large aluminium framework with a movie camera on the front. Within this framework is a mass of pulleys, cogs and motors all dedicated to moving and focussing the camera. Mini angle stepper motors are used for movement, each pulse generating 2.5 degrees of movement, which means that by the time they've been geared down very fine positioning can be achieved.

All this is controlled by the computer. A twin Z80 IMC (International Motion Control), purpose built for this type of application. Big enough for Pete to use as a work desk, it drives twelve motor control boards which in turn pulse the steppers on the Rig. Simple innit?

The ability to repeat moves accurately is one of the biggest advantages of the system. One of the most complicated jobs Pete worked on was the title sequence for BBC's *'The Natural World'*. Six discs fly into the picture one after the other and hover on top of each other. Once they're all in position a globe wipes up and over them, the edges of the discs forming the latitude lines. Each disc was filmed separately flying into frame. Just as one might expect the computer has all sorts of tricks up its sleeve. Programming in basic moves is fairly simple once you get used to the way the thing works, but hidden in the depths of the machine are all sorts of routines for different effects. For instance you can have the camera do a time exposure on each frame and at a preset moment, say halfway through exposure, make the Rig move. The result on film is a moving object with a streaked 'tail' behind it. The length of the tail can be varied during the shoot so that it's made to 'catch up' with the model.

The Moving Picture Company rig is unique, built from scratch on the premises. As Pete put it, 'We thought, what the hell, we can do it better than anyone else — so we bought lathes and milling machines and *did* it ourselves'.

PAINTBOX

THE THING about most systems is that they need a trained operator to make them any more than an impressive piece of useless junk. Quantel's Paintbox, on

BENDERS

the other hand, has been designed so that a complete technical moron can get results at a first sitting.

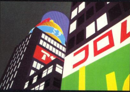
I switched into Complete Technical Moron mode and sat down at Paintbox. A video monitor, a piece of formica and a pencil on the end of a wire lay in front of me. I picked up the pencil and tried writing with it. 'It's broken' I cried. A savage backhander caught me from behind. 'Look at the screen, idiot' screamed Maggie. Was she tiring of me so soon? I looked at the screen and there, sure enough, was a faithful reproduction of my scrawl. I tried writing my name, got it wrong and tried again. Time to let an expert take over. That's where Anne Tilby, one of The Moving Picture Company's designers, came in. I'd given her a few pictures of myself to play around with on Paintbox. Something I might come to regret. I watched as she started work. Oh my God!!

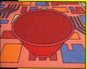
The whole concept of Paintbox keeps all the complex workings completely hidden from the user. He doesn't even need a keyboard. The piece of formica is in fact a digitising tablet, the pencil a stylus and underneath is hidden a complex system for drawing anything producable with traditional drawing materials, and more, but electronically.

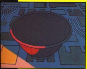
Using the system is simplicity itself. Draw with the stylus on the digitising tablet and the result comes up on the monitor. But there's more to it than that. Wipe the stylus across the screen and the pallette appears, a grid containing thirty predefined colours and a row of various sizes. Touch the stylus on a colour and the stylus 'picks up' the colour. Touch one of the dots to select your brush size and away you go. Then comes the good bit. Paint a blob of colour on the mixing area, pick up another colour and mix it into the first one to get another colour. Grand total of colours available: sixteen million! Van Gogh eat ya heart out . . .

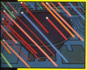
Obviously all of this would be totally useless if created images couldn't be kept. Images can be saved to disc, both complete images and cutouts, and called back in an instant. Acccess time for one image is 1.5 seconds. Pretty

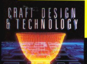
TURN TO PAGE 75







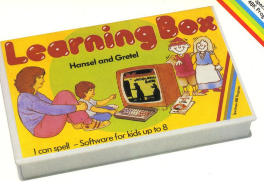




Not just TVFX, but your actual Artshow stuff as well. The series of Caves was shown using Quantie's Paintbox — from the end — user point of view, a formica tablet and a scruffy old bit of pencil — then coloured and overlayed to form a showpiece catalogue cover (left). Total of instantly accessible shades: a lousy sixteen. But mix'em together as if they were paint and this number exponants uphill to a call 30 million. Roll over imagitte!

Access time for any one image using Paintbox is 1.5 seconds. However frames can be stored on film or video tape and then run as fast as you like.

Spectrum
48K Program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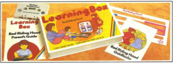
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Learning Box
Red Riding Hood
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Red Riding Hood
Goldilocks

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THE IMAGE BENDERS

CONTINUED FROM PAGE 73

impressive when you consider that each frame uses over a megabyte of information. In addition to this there is a hardware framestore capable of holding up to twenty-five images. Images can be pulled onto the screen fast enough to be animated in real time. This makes it ideal for the animator who can view his work in an instant and alter it in seconds. Hard copy can be taken on Polaroid, colour slide, 35mm movie film or video tape and by the same token images can be taken from either film or video.

The possibilities are mind-blowing. Imagine it — you're making an advert for face cream and your leading lady turns up after a night on the tiles, bags under her eyes and a face full of zits. Panic? No way. Make your film, put it into Paintbox, touch up the blotches and put it straight back on film. No problem. Richard Dean, one of The Moving Company's directors, made the TV commercial for Hills Samuels, the merchant bankers. He used the same technique to make a whole square mile of London appear to drop from the clouds on a massive column of rock!

In typo mode Paintbox can be used as a very comprehensive type-setting facility. Up to six hundred fonts are available and these can be rotated, enlarged or reduced, have shadows, be embossed or given thickness.

All this has some pretty impressive hardware supporting it. Each picture contains just over one megabyte of information and because the system interacts with a user this info needs to be processed fast. You can't muck about with megs on a Spectrum so they whopped a mainframe behind it. Images, cutouts, etc, are stored as files on a 168Mb Winchester alongside a couple of Mb of system data.

But does it play games?

MIRAGE

Mirage is made by Quantel, the makers of Paintbox, and is a machine for manipulating video imagery in real time. Of course there were existing systems for doing this prior to Mirage (remember some of the effects they use on Top of the Pops?) but none quite so versatile. Previously facilities were limited to a predefined set of effects designed by the machine's manufacturers. Need a new effect? Buy a new machine. Mirage has put a stop to all that. Now if you need a new effect you just program it in. As we saw before the effects can be previewed as a wire-frame and adjusted if necessary, then all you need is a piece of video to put in it. What it does is take the video frame by frame as it comes in and make each point on the image directly addressable as a memory location. Of course this is a vast oversimplification. The way the addresses are stored is complicated because each point bears no relationship to the next point. For example, in an explosion effect, the relationship is totally random. Nevertheless, Quantel have sorted it out because the system works like a dream. There's not much you can't do with it. I'd seen the showreel earlier and the screen image was all over the place, the corner can be lifted and folded over like a page turning or rolled into cylinders, cones or globes and moved all over the screen at reduced or enlarged size. Even transparent and exploded images are possible. Mirage can also cope with two images. For example in a simple page turn effect, the second image can be revealed on the back of the first.

Normally Mirage is programmed first and then connected to an edit suite where the video image is put in. It's possible, however, to use it in live television. Effects can be programmed beforehand and then called up on the air. There are also a set of preprogrammed routines for simple effects like page turns and cylinders that can be called up by a non programmer.

'OK, ready', a voice came over an intercom. We looked at the screen and the wire-frame we had seen earlier was replaced by a woman's face. As we watched the image went through all the contortions we had seen the wire-frame go through, folding into a cylinder, rolling around the screen and finally exploding into a mass of fragments. Poor lady.

DIGITAL PICTURES

DIGITAL Pictures live in a basement in downtown Covent Garden.

We decided to have a look at their showreel first. I was impressed — I mean IMPRESSED. 3D letters from an Imperial Tobacco ad logo flew into shot and settled into position one after the other. You'd never know it was a computer graphic. The title sequence from *Weekend World*, due to go out in autumn, showed flyovers of the major cities of the world. The detail was amazing. 'What kind of pixel resolution do you have here', I asked. 'About two thousand by fifteen hundred', Producer Pete Florence remarked casually.

Digital Pictures is one of only two facilities for solid computer graphics in England. Only a year ago it meant a trip to the States. The problems involved are frightening. If you want to get any detail at all then the memory requirements are horrendous. At Digital Pictures each frame of animation uses 9Mb of data. What the hell do you do with that kind of information? Here they use two Data General C330 minis. Because of a bit of internal mucking about they can address 1Mb of memory. Just in case that ain't enough they've each got a 92Mb hard disc as back-up store. Good enough? 'They're a bit outmoded really', resident expert Paul Brown remarked casually. Hard discs outmoded? He saw the look on my face and continued, 'yeah, we thought about bubble memory but it's a bit slow. So we're thinking about laser disc at the moment. Give us a few gigabytes to play around with and we'll really have some fun'.

The real heart of the system is a QLRD Hi-Res film recorder, pointing straight at a Mitchell ciné camera.

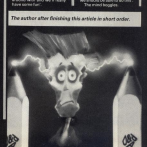
We took a closer look at the hi-res film recorder. This was the piece of gear responsible for putting the digital image on film. It decodes the information from the Data Generals, turns it into an RGB signal and puts it onto a hi-res, flat screen tube in front of the Mitchell.

The actual computing for this lot is handled by the two Data Generals, all the software written in-house by Paul and his oppo Chris Briscoe. How do they get complicated shapes on the screen? Description of the objects is handled by a piece of software known as a Modeller. Shapes are built up using polygons, easily (???!) controlled mathematically and smoothed off by a method called 'Fong shading'. Once the modeller has finished its work the Scripter takes over. This is used to place and move the objects.

The images produced at Digital Pictures are impressive — there's no doubt about that — but reality is something that needs to be worked on. 'The problem is that this method is not the same as the way the eye sees reality', said Paul. In Japan they're looking at a recursive method that emulates the scattering effect of light. He showed me some pictures, a tray of globes, some transparent, some reflecting. They were as real as you could wish. The problem with recursive methods is memory. With 9Mb if you take each point down through just a few levels of recursion you're talking big megs. 'We're working on it . . . some time next year we should be able to do this'.

The mind boggles.

The author after finishing this article in short order.



BIG K's US report from MIKE GOLD . . .

ZIP CODE

Pick of the crop

A year ago, folks were writing off once-mighty Apple. Today those crunchy Californians have shown the rest of us what comebacks are all about. MIKE GOLD reports . . .

BOY, APPLE sure has had a good year.

First they shook everybody up with a truly scary television commercial — produced at a cost of roughly £300,000 and directed by *Alien*'s Ridley Scott. The spot suggested the best way to avoid George Orwell's 1984 was to purchase a Macintosh.

Then Apple really shook everybody up by actually producing the Macintosh on time and right on the money. While the famed IBM PC was resorting to price-cutting, Apple had people lined up around the block to purchase the mighty Mac at full retail price.

When IBM released their much ballyhooed PCjr, consumers took one look at the PCjr and turned their noses up . . . as did many critics. Priced close to the Apple IIe — Apple experienced an increase in sales of both the Mac and the IIe.

PORTABLE

Then Apple announced a cheaper, somewhat more portable version of the IIe called the IIc — now being hocked in the UK. It runs most of the software written for the Apple II series, and industry analysists immediately gave it the thumbs up sign. They predicted the IIc would outsell the PCjr this year, in spite of IBM's four month head-start.

Not bad for a company that, a year ago, some people thought would belly up.

But the best was yet to come. Shortly after May Day, Atari's chief scientist Alan Kay defected to Apple Computer Inc.

In the high-stakes computer game, programmers and designers are like movie stars and Kay is Robert Redford. Atari was counting on him to help them engineer their reconstruction. He delivered — until this spring.

Now 43 years old, Kay a decade ago was an integral part of Xerox's computer development team. That team invented a little thing called the personal computer — an item Xerox passed over as having little consumer potential. Look, everybody makes mistakes.

WHISTLE

Interestingly, some of the technology that went into that embryonic Xerox PC hadn't surfaced until last year, when Apple released the original Lisa. It bombed, but its bells and whistles were plowed over into the Macintosh. With the Xerox-inspired windows and the mouse, Alan Kay should feel right at home.

Kay's a visionary. Whereas he diplomatically thinks the Mac is O.K., the IBM PC is — in Kay's words — "beneath comment".

Atari's loss is Apple's gain. They're trying to recover from last year's $500 million loss, and Kay's changing teams will hurt.

Let's see if Atari strikes back . . .

STATESIDE CHATTER

Stateside Chatter . . . To no one's surprise, among the first programs available for the Macintosh are games — *Transylvania, The Quest* and *The Coveted Mirror*, from Penguin Software. And they said the Mac's mouse and black and white would be useless for gaming.

By the way, if you take apart the Mac's ROM, you will discover built-in routines that allow for color capability.

Over on the Apple II series, Addison Wesley is now producing four so-called non-violent games designed for girls: *Lauren of the 25th Century, Jenny of the Prairie, Chelsea of the South Sea Islands*, and *Cave Girl Clair*. The company should be congratulted for trying to bring girls into the male-dominated hobby, but they are naive if they honestly believe this "nonviolence" stuff is anything more than a marketing gimmick geared to overly protective parents. Ever see a girl play Pac-Man?

These guys also have something else up their sleeves: they will be releasing some of their own software in formats compatible with Apple II, IBM and Atari standards. Sounds fair; that's just what Atari did to Commodore.

And there is an intriguing rumour going about that the home entertainment giant RCA is about to establish a "relationship" with Commodore that will give birth to some sort of joint venture. Best bet: Commodore will produce the goods for RCA's long-expected micro entry.

On the other hand, when RCA trashed their CED videodisc system they suffered their biggest failure since one of their communications satellites spun-off into outer space. The CED was inferior to the laserdisc system but outsold it four-to-one.

This is good news for gamers, as there was much concern that the high-quality laserdisc arcade games (*Dragon's Lair* was the first) would be home-released in the more popular CED system, sacrificing some of the quality and most of the durability found in the laser version.

There's a ton of new stuff available for Coleco games, and lo and behold, some of it is even from Coleco! A new driving game, tie-ins with *WarGames* and those ugly, obnoxious Cabbage Patch dolls, carts from Imagic, Epyx . . . and from Atarisoft: *Galaxian, Pole Position Jungle Hunt, Moon Patrol* and *Joust*.

Coleco's even releasing some of their already popular games in the enhanced Adam format. So now the only question is . . . have the gamers already given up on Coleco?

Also: Sunrise Software's *Campaign '84*, a mock-up of the American pre-election campaign rituals. Over here, we turn our presidential elections into a year-long three ring circus, and Sunrise managed to capture most of it: candidates must choose their position on volatile issues without offending too many special interest groups while at the same time dodging roving TV reporters. This game might not seem as funny after the election. Available for Coleco.

BIG K BOOKS

It may come as a surprise to some of you characters, but words can exist in forms other than coalescences of pixels in a tasteful shade of amber. To renew our acquaintance with the olde worlde of vellum, cuttlefish ink and teams of monks labouring on multi-coloured character-sets, we pulled a few recently published books off the shelves.

Screen Dumps Aid Beeb Books

STEP-BY-STEP PROGRAMMING on the BBC MICRO (IAN GRAHAM: Dorling Kindersley "Screen Shot" £5.95)

As letters to BIG K continually prove, there is no sign yet of any lack of interest in good first-user manuals for the more popular machines,. Such manuals have been unusally slow to arrive, but perhaps we have a contender in the excellently-produced *Screen Shot* series, reviewed here for BBC but also available for Spectrum, Electron, Apple II and CBM 64 computers.

The format is easy-to-follow without being patronising or childish, clearly and expertly written with the best layout I have yet seen in a book of this sort. Totally absent are the gaucheries of American manuals, or the obscurity of some British ones. Each of the large-format pages is dedicated to a particular statement or function, and examples are given and, best of all, superbly illustrated with actual screen dumps.

Considering the production quality and care that has gone into this series, their price of £5.95 begins to look far better value than anything else reviewed on these pages. Rich colours illustrate sections on colour, for example — what you see is (for once) really what you get. Outstandingly good and for beginners or semi-beginners, heavily recommended.

DK
Screen Shot
STEP-BY-STEP PROGRAMMING
BBC MICRO
IAN GRAHAM
BOOK ONE

SO "DORK SLAYER" IS A STRING VARIABLE!

THE COMPUTER & VIDEO GAMES BOOK OF ADVENTURE (KEITH CAMPBELL: Melbourne House £5.95) EXPLORING ADVENTURES ON THE BBC MODEL 'B' (PETER GERRARD: Duckworth £6.95)

EXPLORING ADVENTURES
on the BBC
Model B
Peter Gerrard

As mentioned elsewhere on this page, adventure theory never suffers from explanation. For that reason there's no shortage of explainers. Both these books tackle the subject fairly, with Campbell using his theoretical bits to construct one well-explained master program; while Gerrard manages to give us three in about 40% more space. Both men clearly know their stuff, but where Campbell bravely takes on the entire field of microdom, Gerrard addresses one machine solely — perhaps the least suitable for adventures, the BBC 'B' machine. Using either book you could learn the essentials of adventure-writing — or you *could* just go out and buy The Quill.

— CHEAP BUT C·H·E·E·S·E·Y —

CRAZY GAMES FOR YOUR COMMODORE 64 (HAL RENKO & SAM EDWARDS: Addison-Wesley £3.95) AWESOME GAMES FOR YOUR ATARI COMPUTER (HAL RENKO & SAM EDWARDS: Addison-Wesley £3.95) ASTOUNDING GAMES FOR YOUR APPLE COMPUTER (HAL RENKO & SAM EDWARDS: Addison-Wesley £3.95)

On the way: *Inimical Games for your IBM Computer. Quirky Games for your QL Computer* and *Pedestrian Games for your PDP-11 Computer,* all by good ol' Hal and Sam. Or not, as the case may be. And guess what! They'll probably be the same twenty-five or so games listings as we have here, since what Hal and Sam have dished up for Commodore in this fine, fine collection, they also dish up — give or take a listing or two — for those two other 6502 machines, the Apple and the Atari. Are the games any good? Who knows? Probably. After all, to survive this kind of wholesale transplantation they have to be. These books are of course American buy-ins, and are pitched at the new user athirst to type, but not keen to understand any of it. One stage up (or down) from simply buying software and running it (in which case Hal and Sam are definitely cheaper), and one stage up (or down) from buying a load of computer magazines (in which case Sam and Hal who average 20 pence a listing, are decidedly more expensive). In the last analysis, I've a feeling that Brit buyers will want some documentation with their wall-to-wall glee. Cheap at the price — or just cheap, depending on your outlook, I guess.

AWESOME GAMES FOR YOUR ATARI COMPUTER
HAL RENKO/SAM EDWARDS

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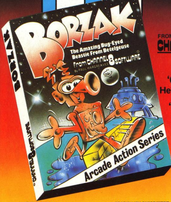
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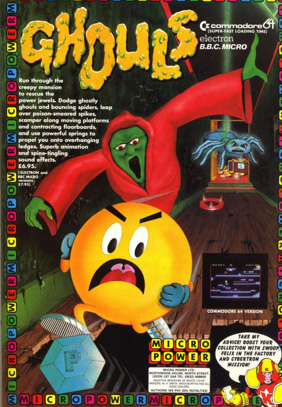
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In days of old when knights were bold and the sheriff was in power, to play this game guide Robin Hood, to Marian locked up in the tower.

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Guide Thomas the cat along the 13 walls of SOLAR street to his lady friend, who awaits him on the end wall, but beware of the flying boots, bottles and mops, which are just a few of the hazards you will encounter.

New Bogy Men

Guide Boris up the ladders, to collect a coin from the top of the screen, but beware! the bogy men are out to get you. He must return to the bottom of the screen, avoiding the bogy men and insert the coin in the electric meter. The lights will come on enabling you to see the pitch fork, and after retrieving it, kill the bogy men.

New Bizy BeeZZzz

When teddy to the picnic went there came the smell of honey So off he went to find the hive to fill his empty tummy. The bees that guard honey pots are sharpening up their stings as teddy fills his empty tum sweet melodys he sings.

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CG78

By TONY TYLER

ME AND MY COMMODORE

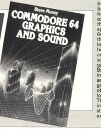
ADVENTURE GAMES FOR THE COMMODORE 64 (R. J. BRADBURY: Granada £6.95)
COMMODORE 64 GAMES (KEVIN BERGIN: Duckworth £6.95)
GAMES COMMODORE 64 COMPUTERS PLAY (ROBERT YOUNG & ROGER BUSH: Addison-Wesley £6.95)
COMMODORE 64 GRAPHICS AND SOUND (STEVE MONEY: Granada £6.95)

Why £6.95? What is it about this particular price figure that makes it so *right*, so *appropriate* for publishers of computer books? In fact it's a truism that most computer books are ludicrously overpriced, certainly compared to computer magazines. The assembly and (more importantly) documentation of a handful of decent games for the ubiquitous 64 is not the easiest job in the world, true, but neither is it the hardest. Young and Bush give us a mixed bag of twenty, all nicely listed in "untranslated" versions) which on the whole is sensible). But on the whole they don't go as far as they might into this business of explanation.

Better in this regard is Kevin Bergin; he provides 18 games, more randomly mixed. Arcade games chase short adventures chase utilities through the list — each of these, by the way, is the size of a good-sized magazine version.

Granada's two offerings, by Bradbury and Money, balance equally between how-to manualism and example listings. Certainly there is a need for specialist volumes on the 64 to explain all those things the offical manual leaves out. Both these books are well thought-out and Money's can also serve as a dedicated games-writing manual. Bradbury takes us deep into adventure theory — sentence parsing, grandfather-father-objects, cell structure for locations, and so forth. The tortuous splitting-off involved in adventure structure is very clearly explained throughout.

GAMES
COMMODORE 64
COMPUTERS PLAY
Robert Young Roger Bush



Slinky brown stuff

SPECTRAVIDEO COMPUTING (IAN SINCLAIR: Granada £6.95)
THE MICRO USER'S BOOK OF TAPE RECORDING (MIKE SALEM: Duckworth £2.95)

Despite glowing reviews when they first appeared about six months ago, the Spectravideo range of computers (two, actually) have not yet exactly taken off like polecats. Perhaps, as MSX draws near, their time will come. In the meantime Granada, clearly with one eye on MSX, have issued a decent first-user manual for the cheaper Spectra machine, written by the respected Ian Sinclair (no relation). It's an honest and reasonably thorough piece of work, no frills, and I like the way Sinclair owned up to the fact that he'd found no way to re-program the function keys.

Assuming tape recording is your thing and the sight of reels rotating sends you into spasms of ecstasy, Mike Salem's lot (geddit?) of knowledge on the subject should fill you with joy. Mysterious sub-topics like Head Azimuth Angle and Cassette Interface Waveforms — all perfectly useful stuff, I'll be bound — grace the 90 pages of this slimline but learned little tome. Scrap that disc! Dump that EPROM! Cassette and all other forms of slinky brown stuff are here to stay. At least, if they're not, then Mike Salem is in bad trouble.

SPECTRAVIDEO
COMPUTING
IAN SINCLAIR

For Vic-20 (unexpanded)

W = UP
X = DOWN
S = FIRE
D = FORWARD
A = STOP

There you are, lifting off the surface of Planet Electro in the warm dusk of an early September evening. Inside the ship — a calm atmosphere. Chip supper courtesy the robochef. Brookside on the VCR. The sundowner (with ice and lemon) nestling in the right hand. Suddenly your Jimmy the One says: "Cap'n! Them mothers out there is shootin' at us!" You look, and sure enough he's right . . .

```
50 PRINT "❐HIT X FOR INSTRUCTIONS"
51 PRINT "OR T TO RUN"
55 GET A$:IF A$="X" THEN GOSUB 1200
56 IF A$="T" THEN RUN 100
57 GOTO 55
100 REM X$="▮▮" ** KILL
110 D$="▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮"
   :X$="▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮"
120 POKE 36879,8:PRINT"❐":Y=10:DX=0
   :S=0:H=0
130 DIM X(2),Y(2),F$(2):FOR I=0 TO 2
   :F$="D":X(I)=10+INT(RND(1)*11)
   :Y(I)=INT(RND(1)*10)+5
140 NEXT I
150 DIM A(2),B(2):FOR I=0 TO 2:A(I)=99
   :NEXT
160 PRINT LEFT$(D$,Y+1)"▮▮▮▮▮▮▮◣>▮▮ ▮
  _"
170 FOR I=8164 TO 8185:POKE I+30720,5
   :POKE 30698,5
180 POKE I,102:IF RND(1)>.5 THEN POKE
   I-22,102:GOTO 210
190 IF RND(1)>.5 THEN POKE I-22,104
   :GOTO 210
200 IF RND(1)>.8 THEN POKE I-22,108
210 NEXT I
220 FOR L=0 TO 2
230 FOR M=1 TO DX-(DX=0):K=PEEK(197)
   :IF K<>9 AND K<>26 THEN 270
240 Y=Y+(K=9)-(K=26):IF Y<1 THEN Y=1
250 IF Y>19 THEN Y=19
260 PRINT LEFT$(D$,Y)"▮▮▮▮▮▮▮      ▮▮▮▮▮
  >▙    "
270 IF DX>0 THEN POKE 36877,130
   :POKE 36878,2:GOSUB 790
280 DX=DX+(K=17)-(K=18)
   :IF DX<0 THEN DX=0
290 IF DX=0 THEN POKE 36877,0
300 IF DX>2 THEN DX=2
310 IF K<>41 THEN 460
320 PRINT LEFT$(D$,Y+1)"▮▮▮▮▮▮▮▮▮▮▮▮==
  ==========":POKE 36878,12
```

```
330 FOR I=250 TO 230 STEP-1:
   POKE 36877,I:NEXT
340 FOR I=0 TO 2
350 IF A(I)>9 AND B(I)=Y1 THEN A(I)=99
   S=S+5
360 IF X(I)<1 OR Y(I)<>Y+1 OR X(I)>21
   THEN 450
370 POKE 36877,250
380 S=S+10:IF F$(I)="M"THEN S=S+20
390 PRINT LEFT$(D$,Y(I))LEFT$(X$,
  X(I))"▮▮▮▮▮ "
400 FOR J=1 TO 10:NEXT J
410 IF F$(I)<>"U"THEN 440
420 S=S+10:IF Y(I)<15 THEN H=h+1
   :GOTO 440
430 POKE 8142+X(I),106
440 X(I)=99
450 NEXT I:PRINT LEFT$(D$,
  Y+1)"▮▮▮▮▮▮▮▮▮▮▮
   :POKE 36877,130:FOKE 36878,2
460 NEXT M:IF X(L)=99 THEN 650
470 PRINT LEFT$(D$,Y(L));LEFT$(X$,
  X(L))" ▮▮▮";
480 IF F$(L)="M"THEN 610
490 IF F$(L)="U"THEN PRINT" ":GOTO 550
500 IF Y(L)=20 AND X(L)<20 THEN PRINT
  "▮";
510 Y(L)=Y(L)-(Y(L)<21)
520 IF PEEK(7680+Y(L)*22+X(L))=108 TH
   EN F$(L)="U":Y(L)=20:PRINT" "
   :GOTO 560
530 IF Y(L)=21 THEN X(L)=X(L)+INT(RND
   (1)*3-1)
540 GOTO 560
550 Y(L)=Y(L)-1:X(L)=X(L)+INT(RND(1)*
   3-1)
560 IF X(L)<1 THEN X(L)=1
570 IF X(L)>20 THEN X(L)=20
580 PRINT LEFT$(D$,Y(L));LEFT$(X$,
  X(L))"◣♠▮▮";:IF F$(L)="U"THEN PRIN
  T"▮▟▮";
590 IF Y(L)=1 AND F$(L)="U"THEN PRINT
  " ":H=H+1:F$(L)="M"
```

PLANET ELECTRO

by C. MILL

```
600 GOTO 650
610 X(L)=X(L)+(X(L)>7)-(X(L)<7)
620 Y(L)=Y(L)+((Y(L)<Y+1)-(Y(L)<Y+1))
   *(X(L)<15)
630 PRINT LEFT$(D$,Y(L));LEFT$(X$,
   X(L))"▛●"
640 IF X(L)>6 AND X(L)<10 AND Y(L)=Y+
   1 THEN 990
650 IF X(L)<>99 OR RND(1)<.9 THEN 680
660 X(L)=INT(RND(1)*10)+10
   :Y(L)=INT(RND(1)*5)+10:F$(L)="D"
670 IF RND(1)>.8 THEN F$(L)="M"
680 FOR M=0 TO 2:IF A(M)<25 THEN 710
690 C=INT(RND(1)*3):IF X(C)=99 OR(RND
   (1)<.97 AND F$(C)<>"M")THEN 760
700 A(M)=X(C):B(M)=Y(C):GOTO 720
710 PRINT LEFT$(D$,B(M));LEFT$(X$,
   A(M))" "
720 B(M)=B(M)+(B(M)>Y+1)-(B(M)<Y+1)
730 A(M)=A(M)+(A(M)>8)-(A(M)<8)
740 PRINT LEFT$(D$,B(M));LEFT$(X$,
   A(M))"▬."
750 IF A(M)>6 AND A(M)<10 AND B(M)=Y+
   1 THEN 990
760 NEXT M
770 NEXT L:IF H<10 THEN 220
780 GOTO 990
790 FOR I=8142 TO 8162
   :POKE I,PEEK(I+1):NEXT
800 IF PEEK(7690+Y*22)<>32 THEN 990
810 IF RND(1)>.5 THEN POKE 8163,102
   :GOTO 850
820 IF RND(1)>.5 THEN POKE 8163,104
   :GOTO 850
830 IF RND(1)>.7 THEN POKE 8163,108
   :GOTO 850
840 POKE 8163,32
850 FOR I=0 TO 2:IF X(I)=99 THEN 950
860 IF X(I)>0 THEN 910
870 PRINT LEFT$(D$,Y(I))" ▓▓";
   :IF F$(I)="U"THEN PRINT" ":H=H+1
```

```
880 X(I)=20:Y(I)=INT(RND(1)*8)+10
   :F$(I)="D"
890 IF RND(1)>.9 THEN F$(I)="M"
900 IF RND(1)>.8 THEN F$(I)="U"
   :Y(I)=18
910 X(I)=X(I)-1:PRINT LEFT$(D$,Y(I));
   LEFT$(X$,X(I));:IF F$(I)="M"THEN 9
   40 >
920 PRINT"◣▲ ▓▓▌";:IF F$(I)="U"THEN P
   RINT"▩▁"
930 GOTO 950
940 PRINT"▛● "
950 IF A(I)=99 THEN 980
960 IF A(I)<=0 THEN PRINT LEFT$(D$,
   B(I))" ":A(I)=99:GOTO 980
970 A(I)=A(I)-1:PRINT LEFT$(D$,B(I));
   LEFT$(X$,A(I))"▬. "
980 NEXT I:RETURN
990 POKE 36878,15:POKE 36877,220
   :FOR I=1 TO 500:NEXT:POKE 36877,130
1000 POKE 36879,42:PRINT LEFT$(D$,
   Y+1);LEFT$(X$,7)"▛-*-"
   :FOR I=1 TO 75
1010 L=7710+Y*22:L=L+INT(RND(1)*I)-IN
   T(RND(1)*I):POKE 36878,15-INT(I/5)
1020 L1=INT(RND(1)*I)-INT(RND(1)*I)
1030 L=L+L1*22:IF L<7680 THEN L=7680
1040 IF L>8185 THEN L=8185
1050 POKE 30720+L,1:POKE L,46:NEXT
1060 POKE 36879,27
1070 FOR I=1 TO 500:NEXT
1080 POKE 198,0:POKE 36877,0
1090 PRINT"▣GAME OVER - SCORE"S
1100 PRINT "▓▓HIT-Y"
1110 GET A$:IF A$<>"Y" THEN 1110
1120 RUN
1200 PRINT "▣*** PLANET ELECTRO ***"
1210 PRINT "▓▓W-UP"
1220 PRINT "X-DOWN"
1230 PRINT "S-FIRE"
1240 PRINT "D-FORWARD"
1250 PRINT "A-STOP"
1260 PRINT "▓▓HIT T TWICE"
1300 GET A$:IF A$="" THEN 1300
1310 RETURN
```

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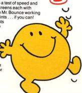

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ARCADE ALLEY

THERE'S NO mistaking the Tazmi TX1, latest in one of the oldest of arcade staples, the simulated racing car game.

For a start, it's almost as large as the real thing. More eye-catchingly, there are three screens rather than the usual one. The panoramic view that ensues is quite striking, particularly — once you get that far — in a night-time sequence. Otherwise, I suspect that the triple screen effect is more of an appealing gimmick than an aid to the game itself. Because although there *is* a much broader panorama than in the usual one-screen games, there's no real use of the three screens within the confines of the game itself, i.e. you can't, for example, see cars approaching (receding?) from a distance — so far as this punter could make out anyhow, all the action occurs on the familiar central screen.

Still, it does look good.

Tell a lie: on the left-hand screen there is a small inset of the whole course in which you can glimpse your overall progress. Mind you, the 'race' takes place at such a clip that a novice probably won't have the time or the inclination to look away from the dead ahead. There's a brake, accelerator and a two-speed (High, Low) gear-stick. The wheel controls are hairsbreadth fine — as presumably they are on the full speed real thing — so that the slightest movement has its effect.

Being a non-driver, the merest hint of a curve in the monitors had me veering wildly. The first indication of this happening is when you hear yourself skidding; fail to check that and you go into a spin; unless you're quick and correct your motion there's a good chance that disaster will occur when your vehicle hits one of several thoughtfully placed billboards, walls etc. The race takes place in four progressive stages; if you get as far as the last of these a flick of the wheel enables you to choose from one of eight Grand Prix circuits — Monaco etc. etc. Whether these are actual replicas of the real thing, only an expert could tell you. To a non-driving layman it's all pretty convincing. After only ten minutes' play I had three broken ribs, a lacerated leg, severe burns all over my body and irreversible brain damage. I left the arcade with a statuesque blonde on each arm and a magnum of champagne at my lips. It has to be said: after TX1 any ordinary racing game is . . . just the pits!

FIRST stage
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EXTENDED
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SPEED
1ST
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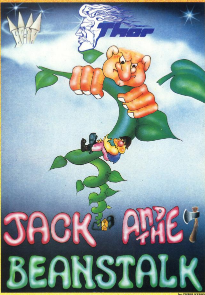
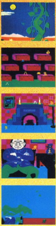


by CHRIS KERRY



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Letters to BIG K

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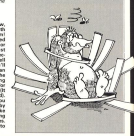
APE FAN

WHAT KONG game do you think is best for the Commodore 64?
ANALECHI NIVADI
London

● We just don't know, vieux haricot. The truth is, we can't abide 'em! Dodgin' that dratted anthropoid's barrels (or other flotsam) just doesn't turn our collective crankshaft. Tell you wot, tho'. We'll give £5 to the Kong fan who can contrive the most awe-inspiring and convincing plug for his personal choice. (It had better be good). You never know, you might get spotted by Saatchi's and make your fortune be selling oil to the Arab states. Me? I'm still waiting to be spotted.



Combien?

I HAVE written a couple of programs myself and would like to know how much Big K pays for them.
MARK RYAN,
Blackpool.

● We don't have a given fixed sum, as the quality, originality and sheer graft that goes into progs varies so much. Howzabout minimum £50 up-wize to £100 on the sliding-shekels-scale?

If you do want your prog to get a quick going over, note that priority is given to those with clear documentation attached. (And label your cassette clearly.) Equally alluring (if you have the technology,) is a prog tastefully wrapped in its own 40 column print-out.

An Irate Pensioner Writes

THE Video Recordings Bill was bought in because nasty-minded little men, such as film producers and the current TV producers (who would probably peddle their own Granny for money,) chose to pander to the sick-minded and perverted in the fierce race for cash.

As I write, my own grandchildren are busy playing and enjoying a "clean" computer game. No one deplores the fun violence in the 'A-Team' or 'The Fall Guy'. The objection is to unchecked programming executed by exploiters, perverts and sadists in their unprincipled efforts to obtain wealth.
W. LOXTON
Mablethorpe.

● We're not wild about pervs and sadists either, Pops — honest. What Big K stands for (trumpets!) is clear thinking on very important legislation that could have far reaching effects for us all. If we've got to have censorship, then the Who, the How, and the Why must be debated in public. And let's make it specific to this vast, important, popular and unique industry. It's not only inadequate but ignorant to try to lump in vid games with legislation existing for video films.

The inappropriately named Mr Bright will find in his dictionary that *video* simply means 'I see'. Both films and games require 'seeing', but apart from that, they just ain't the same ball game at all.

Let us reiterate. There has been NO actual prosecution in this country for "video game obscenity". And there's no real evidence of Marquis de Sade types writing programs, either. Don't panic.

No Subs, Use Force

I WOULD like to know how much it would be to send me Issue No 1 of your great magazine.
ADRIAN PINN,
Exeter.

● Whoops! Sorry Ade, and all those others who've been writing in asking for back issues. 'Fraid the demand has been so great that we're flush outa copies. And until that rapidly approaching time when subscriptions will be freely available, the only solution is to flex those speedy, well-oiled video-reflexes over the counter of your nearest newsagent each time release day draws nigh. But no violence, please. Oh all right — just a bit.

Earnest plea

I AM the World's Greatest Electron User. Well done — for actually caring for us old mistreated Electron types. It's not Acorn's fault that they didn't get our micros out in time.
ASIF KHAN
Hounslow

● Why isn't it Acorn's fault? Know something we don't?

Yours Unrepentantly, A Software Pirate . . .

YES, I do copy programs from friends' tapes — and I make audio copies using two tape decks. I know it's theft and I honestly don't care. Here's why. Computer software is, in the main, overpriced rubbish. Just like music. I buy a lot of records and I also tape a lot because I have been fleeced enough by record companies. £5 plus for a record is quite a lot, considering an average of 40p goes to the musician. Alright, you may say I'm not helping the poor muso very much by taping his songs, etc, but I'm a semi-pro musician myself. Somebody like David Bowie or Sting is hardly going to miss 40p, and anyway, there is something in the laws of patent about copying which the anti-tape brigade never mention.

It is no breach of patent to manufacture a copy of the patented article for one's own use, or to give a copy to a friend. It seems record companies and software houses want the best of both worlds. Surely the Copyright laws and Patent laws are brothers under the skin, so surely home taping is perfectly legal?

I would be less inclinded to copy software if it was better value for money. It is recorded on really cheap quality tapes, badly packaged, poorly illustrated (Hi, Artic!) and as for the standard of English . . .

Finally I am very shocked that you should wish to kiss the arses of the software houses with sycophantic, anti-tape-piracy articles. Why on earth didn't you raise the points I have mentioned? Does it mean you have a personal interest in a software company? Or do you just want to keep your advertisers sweet?

I'd like some feedback on all this, from readers, writers, and companies themselves, without the waffle about loss of profits, etc, because I don't care. I just want better software and at a lower cost, and I want it now!

PAUL BELLAMY,
Sheffield.

● Of course it's perfectly possible to take the full-blooded anarchist point of view, as you have. It's no more than the truth that as the megastars who make and sell programs and records are all so rich, they won't miss *your* money. I think you destroy your own case, however, by saying that you would be less inclined to copy software if it was better value for money. Why "less inclined"? Surely your fearless stand shouldn't be diluted by false and bourgeous considerations of things like "value for money"? And isn't it true that people like you would still feel aggrieved and ripped off even if it came free with the milk? Ergo, you feel exploited and you want revenge. Understandable, but don't climb on a moral soapbox about it.

Do I have a personal interest in a software company? No. Do I want to keep my advertisers sweet? Of course, but not at all costs. And this problem affects all software makers, not just those who have the inkredibly good taste to advertise in BIG K. — Tony Tyler.

Ripped off

NEXT TIME you need a poll, could you please put some useless advert on the reverse side, or make it double sided, or get on-line with a modem?

D. BUDGEN,
London.

● We had no idea, D.! Didn't think you'd treasure our Mike Male 'He wrote one' piece so dearly. Just for you, we're going to use the Batphone. Meanwhile, I've got to calm down the Editor, who interviewed Mike Male. Thanks to you he now thinks he's written a classic.

Slow down

I'M SURE that a lot of people who have computers don't know or understand everything that is written, so an indepth study in plain and simple young people's English would be welcomed by a great many people.

R. HARRIS
Leics.

WHY DON'T you get a learners' section in your magazine?

JOE BENSON
Limerick, Ireland.

● The aim of Big K is to pitch at all levels at once, so there's something for everyone in each fab ish. You'll pick up more than you realise when you're having fun — so stop worrying about their intimidating bits, get your head down and enjoy!

LINE NOISE

MY FRIEND told me that he had had problems loading a game on his Dragon. However, he discovered that by moving the power supply as far away from the TV as possible, his problem disappeared, and the tape loaded straight away. When I got home, I tried doing the same thing with my machine, and it loaded first time. Why?

ASLAN SEZEN
Charlton.

● What your mate was getting was a nasty dose of "line noise." Remember that anything metallic that's attached to your micro will act as sort of mini radio transmitter. So if your machine starts giving you stick with interference or general malingering, it's worth having a quick spot check on your proximities. A'right?

"HE'S BEEN LIKE THIS EVER SINCE HE DISCOVERED THE PASSWORD FOR WHITBREAD'S BREWERY."

TONY BENYON

CONTINUED FROM PAGE 54

ATARI GRAPHICS

Using Antic mode 4

The best use of this mode is with a redefined character set. Using this you can create some very colourful effects on the screen.

The following program utilises this to create some coloured bars on the screen. As we are going to only use 4 characters there is no need to copy the whole character set across and I only define the four characters that I will be using, i.e., a, b, c and d (see last month's issue).

```
10  MEMTOP=PEEK(106):
POKE106,MEMTOP-8
20  GRAPHICS 0:CHSET=
(MEMTOP-4)*256
30  DL=PEEK(560)+256*
PEEK(561)
40  POKE DL+3,68:FOR X
=6 TO 28
50  POKE DL+X,4:NEXT X
60  FOR X=0 TO 31:READ A
70  POKE CHSET+97*8+
X,A:NEXT X
80  DATA 255,255,255,
255,255,255,255,255
90  DATA 85,85,85,85,85,
85,85,85
100  DATA 170,170,170,
170,170,170,170,170,170
110  DATA 85,170,85,170,
85,170,85,170
120  FOR Y=1 TO 20:FOR
X=1 TO 8
130  PRINT "abcd";:NEXT X
140  PRINT:NEXT Y:
PRINT
150  GOTO 150
```

As you can see there are four stripes of different colours across the screen. If you wish to see a few colour variations change line 150 as below and add the other lines:

```
150 FOR X=0 TO 255:
POKE 708,X:NEXT X:PO
KE 708,40
160  FOR X=0 TO 255:
POKE 709,X:NEXT X:PO
KE 709,202
160  FOR X=0 TO 255:
POKE 709,X:NEXT X:PO
KE 709,202
170  FOR X=0 TO 255:
POKE 710,X:NEXT X:PO
KE 710,48
180  GOTO 180
```

Another possible variation on this is to see what effect printing all of these new characters in the inverse mode (i.e., after pressing the Atari logo key) has on their colours. The only one affected will be the blue 'a' which becomes purple. This is in fact the true fourth colour. The 'd' is actually a mixture of 'b' and 'c'. The best way to find out what colours are possible is by experimenting. Do not forget that you can change the default colours by using either the SETCOLOR statement or by POKEing the colours directly.

As I promised last month both redefined characters and Antic mode 4 will be used to create a game for next month's issue. I am glad to report that it is now well on the way to completion.

The idea behind it is that you are in a power boat going down a river. In order to navigate your way safely you will have to blast boulders out of your way. The screen is in Antic mode 4, the river, its banks and the boulders are all redefined characters and the boat with its torpedoes are going to be player missiles. Despite the fact that the game is written totally in Basic with absolutely no machine code whatsoever it still runs quite fast. To find out how book next month's copy right now!

BOOST YOUR BEEB'S MEMORY

FROM PAGE 53

```
1150          EQUD &0D212157
1160          EQUB 0
1170   ]:NEXT
1175
1180 REM_______________
1185
1190 FOR pass%=0 TO 2 STEP 2
1200   P%=&74
1210   [OPT pass%
1220          LDY #0
1230          LDA &FE30
1240          STA &73
1250          LDA #12
1260          STA &FE30
1270          LDA &70
1280          STA (&71),Y
1290          LDA &73
1300          STA &FE30
1310          RTS
1320   ]:NEXT
1340 ENDPROC
1355
1360 REM____________________
1365
1370 DEFPROCdump
1380 PRINT''"DUMPING TO RAM"
1390 PRINT''"PLEASE WAIT"
1400 FOR I%=0 TO &7FF
1410
PROCwrite(?(buffer%+I%),&8000+I%)
 1420   NEXT
 1430 VDU7
 1440 PRINT'''"PRESS <BREAK> ONCE"
 1450 PRINT''"THEN '*TEST'"
 1460 PRINT''"IF ALL IS WELL
 YOU WILL GET A MESSAGE"
 1470 ENDPROC
 1475
 1480 REM____________________
 1485
 1490 DEFPROCwrite(data%,address%)
 1500 ?&70=data%
 1510 ?&71=address% MOD 256
 1511 ?&72=address% DIV 256
 1520 CALL &74
 1530 ENDPROC
 1535
 1540 REM____________________
 1545
 1550 DEFPROCread(address%)
 1560 ?&F6=address% MOD 256
 1570 ?&F7=address% DIV 256
 1580 Y%=12
 1590 data%=USR OSRDRM
 1600 ENDPROC
```

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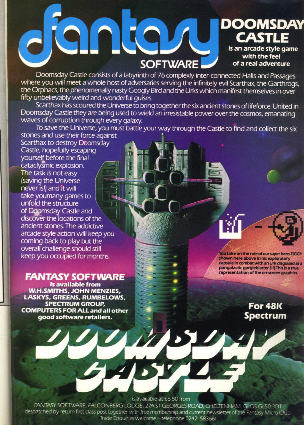

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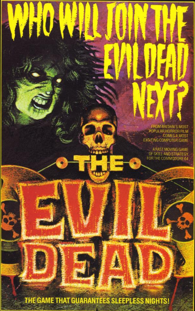
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