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NEXT

COMPUTER & VIDEO GAMES

Hot on the heels of the Book of Games comes our Book of Reviews in the March issue.

Our next issue boasts a free giveaway guide to all kinds of computer games, who supplies them and how they compare.

We have sections on adventure games, chess, draughts, otello and backgammon games, arcade maze games, space attack games, novelty games and many more.

There's expert advice on how to choose the particular type of game you are interested in, what you should be looking for and what standards to expect.

WHAT'S BUGGIN' YOU?



Not getting a regular copy of Computer & Video Games? How do you expect your micro to work proper if you aren't reading the magazine every issue? And you with a nice little computer like that too.

Of course, I can't promise that if you had a regular copy of CMVG on order, your rumpack would mysteriously stop wobbling overnight... but who can tell eh...

Just fill in the coupon (below) or I'll let you see your sister again.

Know what I mean?

To my newspapers. Please deliver me a copy of Computer & Video Games every month. Price 35p.

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For those of you unfamiliar with particular games, we have devoted a page to explaining the differences between Donkey Kong and Frogger, how to recognise a Galaxian when you see one and how to tell whether a Pacman ghost is edible or not.

Each cassette or disc reviewed is marked in our usual three categories, Getting Started, Value and Playability and if it scores three 1s you know our judges have been suitably impressed.

It all adds up to the most striking work yet in games software and it's free inside every copy of Computer & Video Games.

All you Seventh Empire competitors will need our March issue to check out your new position in the Seventh Empire game.

You might have proved to be the best fleet commander in the galaxy and earned yourself a Colour Game on the way.

But even if you work out your score to be well behind the leaders, keep your fleets on the move in March there's still plenty of time to catch up.

Among our top games for March will be a version of Donkey Kong — featuring Mario the carpenter and an escaped gorilla Digger will ask you to dig a hole and trap a rampaging alien; there's Skiing, Reified and Dr Who Adventure.



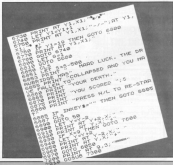
Confessions of a Bug

So you think it's easy being a Bug hub? Well you should try attacking a Dodge listing past the Computer & Video Games testers.

The month of January '80, we didn't do too bad. Mal Function managed to pull a whole host of lines out of the ZX11 game Cards of the Aztec Tombs (shown below).

On Game Flight most of you managed to spot the two arrow errors. In line 2040 the arrow should point left in line 2018 the arrow should point right.

Dragon problems are fixed by:
200 IF INKETS= THEN 200
100 CLS: CLEAR 200: FOR I=0 TO 448 STEP 32: PRINT @ I, CHR\$(245): PRINT @ I+31, CHR\$(20): NEXT I: PRINT @ 0, STR\$(20/3200), 300 FOR I=0 TO 161 STEP 32: PRINT @ I, STR\$(30/340+(I-1)/20): NEXT I: RETURN



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SPECTRUM OUTBURST

Dear Sir,
I really must reply to Mr McAuley's extraordinary outburst on the Sinclair Spectrum.

The fault record of previous Sinclair machines was truly deplorable. A number of my friends and colleagues have had them. All have had problems and one told me that the ZX21 he bought in April this year has been back to Sinclair four times so far. It has been in his hands for only seven weeks so far.

The Spectrum may be better, so few have been closed so far that we cannot judge.

Sinclair machines are primarily meant for entertainment only. The Basic used is both limiting and limited with a consequent effect on possible programs.

Judging by the reaction of my nine-year-old son, who has used a friend's Spectrum, it is no worse within three months. It is for a three month try is expensive by my standards.

Most adults are prevailed upon to buy a micro with two distinct arguments (a) to assist in the education of their children.

(b) to use themselves for serious work.

What serious work could be done on a Spectrum? A payroll... for maybe twenty employees? Stock control the package may seem fine and five movements each per week? Word processing is out, unless CPM compatibility.

As for his pessimistic paragraph, it is really telling us that Sinclair computers compete with the likes of IBM, Canon, Burroughs etc! Indeed, Sinclair manufactured calculators in the past, and micro now, but I was not aware that Sinclair made or have ever made computers!

"TTY is the best in the world" I have live in Germany, France, Italy, Canada, Australia and the USA. With the exception of much native USA product, all these countries produce first class TV programmes.

If I had only £1000 to spend I don't think I'd buy either any Sinclair product or the Basic.

I think I'd go for the Centre II — a much underrated machine. As it is, I spend rather more on a S4E machine nearly a year ago, with one of the latest staff of a bank/office in fact. Good for games, and with CPM, equally so for business.

Lastly, "Marketing, then does prove too much" Mr McAuley? It is Bill Woodford's choice, I am.

BBC IS THE BEST, OK?

Dear Sir,
I have just read Alan McAuley's letter in your December issue with delight. He is actually used a BBC Micro? I doubt it very much.

For all those Spectrum owners, who, mistakenly, think the Spectrum is "better" than the BBC Micro, just look at the facts.

Spectrum good points: System cheap or easy, cheap price.

Spectrum bad points: Slow BASIC 0-9 three slower than the BBC Micro.

Poor quality sound (the BBC Micro has four sound channels with full ADSP control). High resolution graphics poor. Keyboards extremely difficult to type fast on (BBC Micro has a very good keyboard). Keyboard control a waste of time: up to six key presses needed for some functions! (Anyway, most BBC Basic commands can be abbreviated).

Note that I haven't

mentioned the BBC Micro's built-in assembler, the Scible Mode system for choosing screen format, the superb extended Microsoft Basic or the brilliant software available: just look closely at the Assessment range.

I hope this letter has finally alerted to all those Spectrum owners that the BBC Micro is the best home computer in the world.
Richard K Lloyd,
Firing,
Macclesfield.

ICE VENDOR VINDICATED!

Dear Sir,
With reference to Computer and Video Games issue number 13 — November 1985, I am writing to complain about the ProApple program, Ice Cream Vendor. Line 10 reads:
VTAB 10: PRINT TAB (10)

I was putting the program in our Pet computer at school when after the 10 we typed the program and a syntax



error appeared in line 10. We tried deleting the "V" in 10 and that didn't work then we tried a space between the "V" and the "tab" but that still didn't work.

After about 10 minutes of puzzling it out we decided on deleting the "V" and the "tab" and Bingo! it worked!
Andrew Gardner,
Shardle,
Isle of Wight.

ALIEN CHASE AMENDMENTS

Dear Sir,
Many thanks for the excellent standard of games in your magazine. I haven't typed in a bad one yet!

However, the December issue BBC game Alien Chase could give those of us with more 1-1000 operating systems some trouble.

In order to retain the features of the game, it changes need to be made:
100 IF VDF=20,20,000
110 IF INKEY= - 89 THEN
P# = 200 ELSE IF
INKEY = 100 THEN P# = 240
ELSE IF INKEY 1 - 99 THEN
P# = 100

This does the trick and the game proceeds as designed. I have also written an amendment for systems:
110 IF (ADVAL/84000) - 1
P# = 200 ELSE IF
ADVAL(1) - 2 000 P# = 240
ELSE IF ADVAL (1) - 4000
P# = 100

Dear Carlos,
Gorford,
Leeds.

TANDY AND THE DRAGON

Dear Sir,
Please could you tell me if the Tandy TRS-80 machines use the same machine code as the Dragon 32 and if you can use Tandy games on it? If there are any other computers that use the same machine code could you tell me about them.

John De Silva,
Guthrie,
Surrey.

Editor's reply: The Dragon is based on the Tandy Colour Computer — not the TRS-80. It is therefore impossible to take the latter's machine code, which is for the 8088 microprocessor, and use it on the Colour Computer/ Dragon 32, which has the 8086 processor.

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SEARCH FOR SOFTWARE

Dear Sir,
Having bought a Dragon 32 micro-computer I have found that up to now there has been a lack of available software for it.

I have heard, however, that because it uses microsoft basic it is possible to use software from the Tandy Colour Computer and the BBC computer. Is this correct?

And will you be featuring the programs for the Dragon in the next issue? Keep on the excellent (and) world Simon Males, Strayth, Northamptonshire.

Editor's reply: It is possible to enter listings for programs designed for the Tandy Colour Computer with very little modification.

Although all the more popular computers claim to use Microsoft Basic, there are so many different versions that it is very difficult to translate Pet to Apple to TRS-80 to Colour Computer/Dragon 32.

The BBC does not use Microsoft Basic it uses a peculiar and unique Basic that is supposed to be compatible with Microsoft. This is rather a tenuous claim for some of the commands!

THE DREADED DISC QUIZ

Dear Sir,
As a video games enthusiast and the proud owner of an Intellivision game console, I was delighted to find your magazine at my local newspaper and have taken it regularly ever since.

Although I do not own a name at present and so cannot run the programs listed each month, I do get immense enjoyment from reading all the other features, i.e. Mailbag, Games News, Arcade Action and so on.

However, having said that, I have heard that Mattel do plan to launch an add-on keyboard about March of

this year so there are some programming possibilities.

My main reason for writing to you is to try to find out what other people think of the Mattel system and in particular the "dreaded disc", their alternative to either cassette or cassettes as favoured by Atari, etc.

Although I find the disc reasonably easy to manage myself, most of my friends seem to disagree. Perhaps if this version could be cut through to Mattel they may seriously consider bringing out some alternative form of storage.

Finally, here is a list of my current high scores: Space Armada 580,500; Asteromash 1,128,700; Look'n'Chase 120,800; Space Hawk 333,000.

I would be most interested to learn if anyone can beat these or of any other high scores on Mattel games. Marc Duffield, Huddersfield, Yorks.

BACK TO THE MANUAL . . .

Dear Sir,
Please would you explain how to introduce variables into a defined function from the main body of a program for BBC Basic.

Newsa Sharma, Slough, Berkshire.
Editor's reply: This is quite complex Basic programming. I suggest you look at page 208 in the BBC manual.

GETTING THE CONNECTION

Dear Sir,
We have a BBC Model B at our school. We also have two printers, an Epson dot matrix printer M200 P1T and an XEROX P1T type II which we use with our Research Machines 1602.

I have some programs for



THE BUGS ARE OUT!

Dear Sir,
One night after I had fallen asleep over my Sinclair Spectrum I was suddenly woken by cries of "Stamp on him", "Stomp a chick in his mouth" and so on. I jumped up, grabbed my camera and managed to get a photo of this amazing street before they all disappeared inside my copy of Computer and Video Games!

Please print the photograph otherwise no-one will ever believe me. J. Carroll, Rother, Lancashire.

the BBC which I require hard copies of, and as we do not yet have a BBC printer I was wondering whether either of the printers are compatible.

Could you also advise me on the best Space Invader type games for the BBC? Maria Hodges, Birmingham, Kent.

Editor's reply: If you have a Model B computer then the Epson printers — with RS232C interfaces — should work OK, however, the socket at the rear of the BBC computer — 5-way P12 — is non-standard for RS232C. In a special cable is required. One page 186 of manual. Continuous parallel standard is available

through the parallel printer port. It all depends on your printers which standard you use.

Both of the following companies produce good Invader-type programs. Write to: **Widge Software, 34 Farnwood, Margate Bridge, Southport, Merseyside**; **Andra Software, 13 Cherry Bonnets Road, Girton, Cambridge CB3 0HT.**

JOIN UP FOR ADVENTURE

Dear Sir,
A joint BBC Micro Adventure/Fantasy Club has now been formed. The club will provide a central library of Adventure and Fantasy games written by the members for the use of other members.

In this way Adventurers can find a ready group of fellow enthusiasts to share their fantastic journeys. Send an a.s.c. for further details. BBC Micro Adventure Club, 29 Barchingham Drive, Laxfield, West, NR24 6NR.

MYSTERIES OF THE SCROLL

Dear Sir,
Recently I have been trying to get my Vir to print random data on the screen at random, then scroll the screen from right to left, while still printing dots at random. My attempts have been fruitless.

Please could you tell me the solution before I go mad with frustration? J. Shindler, Southwicks, West Midlands.

Editor's reply: It is easy, using the Pulse instruction to get random data on the screen. For example, using the information on page 143/144 of the Vir instruction manual, 30 a = INT(RND) (1600 + 1) 30 POKE 7800 + a,41 30 GOTO 10

This will produce a random pattern of stars. I suggest you read the appropriate section of the Vir Revealed, by Nick Manganite for ideas on how to scroll from left to right — it's far too complicated to explain in this small space.

Solving our earth invading puzzle

Saving the Earth from the alien hordes was the problem we set you last month and the more spirited defenders amongst you replied swiftly enough to keep our atmosphere free for eyes to gaze.

The best solution Trevor Tranter could manage was 21 shots to clear the atmosphere, or just two missed shots.

His best effort began at F and went on: A, E, R, E, C, C, D, B, B, F, B, C, C, F, C, A, B, A, C, D, F.

We will be publishing the winning names next month.

And Trevor's back with another Puzzling column in March.



A GOOD HOME FOR A DRAGON

The Sorcerer's Stone has captured a Dragon for its corner.

Andy Burnes of Linde Lane, Boston, Preston in Lancashire, is the worthy winner of the Fantasy Game Competition we set in our November issue.

He wins a Dragon 32 micro-computer on which to pursue his thirst for fantasy games. And he is also being invited down by Mike Wazgamez, which judged the competition entries, to discuss putting Sorcerer's Stone into operation as a new computer moderated game format to be played commercially.

Mark Shindell, of Mike Wazgamez was impressed by the high standard of entries and offers his congratulations to the unlucky winners, but felt that Sorcerer's Stone came closest to a workable computer moderated game format. "The author had put a lot of thought into how the game could be put onto a computer," said Mark.

Sorcerer's Stone is a game for

15-18 players, who each takes control of a wizard in a tower. The aim is to capture the Sorcerer's Stone by making use of the wizard's magic, elves and dwarfish servants and casting spells by using up power points.

PIRATE WITH A HEART OF GOLD

I'm the brightest buccaneer, the Simon Templar of the Space lanes, the man in the white space helmet. I may be a Pirate King but I am a Good Guy. I seek out and eliminate the outcasts of my arch enemies, the oppressive Berberbers.

One of these, Olan, has been a thorn in my flesh with his absurd threats and impudence.

Another, a former ally of mine, threatened me recently so I sent the fleet in.

I liberate the oppressed prey of Berberbers, set free those under the yoke of Empire Builders like Merchants and Artifact collectors.

And what do I take in return? I do not seek to kill populations or make people work hard on my fleet, all I ask for the liberation of the oppressed is a little piece of the booty, a few specialists, some miscellaneous, like to ask for my services to life-time.

It must be shown that aggression does not pay, aggressors must be punished, and I am the man capable of such a feat.

I am amazing a Task Force.

A collection of fleets, this force will be so fast that when in fleet formation it will almost blot out the most powerful of Suns.

A force so huge and powerful that Berberber robots will quail at its presence, and Apostles will pray at its coming.

This task force will be headed by myself in the flagship, A.C. Freedom-for-All ready to wage terrible war on evil-doers.

We will fight them on the Space-lanes, at the planets and near the Black Holes, there will be blood, oil, and tears, but we will never surrender. . . .

There is No Alternative but to stand up and fight. The time for Diplomacy is over, the time for action is here. Fight, we will, for the elimination of Berberbers and life-kind's inalienable right to be free!

I am so cool I could freeze a Penguin, and I am so hip I have difficulty seeing over my pelvis.

Never let it be said that Austin Cambridge did not play the major role in the freedom of the Galaxy.

the Sorcerer's Stone has captured a Dragon for its corner.

Andy Burnes of Linde Lane, Boston, Preston in Lancashire, is the worthy winner of the Fantasy Game Competition we set in our November issue.

He wins a Dragon 32 micro-computer on which to pursue his thirst for fantasy games. And he is also being invited down by Mike Wazgamez, which judged the competition entries, to discuss putting Sorcerer's Stone into operation as a new computer moderated game format to be played commercially.

Mark Shindell, of Mike Wazgamez was impressed by the high standard of entries and offers his congratulations to the unlucky winners, but felt that Sorcerer's Stone came closest to a workable computer moderated game format. "The author had put a lot of thought into how the game could be put onto a computer," said Mark.

Sorcerer's Stone is a game for



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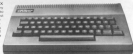
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NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS GAMES NEWS

MYSTERY OF THE DARKLY GLOWING GEM

BLACK CRYSTAL

In order to win the Black Crystal you must first seek out the seven gold rings and place them on their pedestals — ranged in a circle around the brilliant gem.

But even before you get to see the crystal you will have to overcome dozens of dangerous challenges. The sheer number of episodes in this game make it one of the longest adventures ever written — with 12 different screen presentations.

As you pursue your adventure you have three main strengths to supplement your natural cunning. Physical strength consists of your two principal weapons, a sword and a shield.

Forty enables you to be brought back to life if you meet with a grisly end at the claws of one of the dragons or vampires which haunt this adventure.

The spiritual strengths at your disposal are lightning and "power-orchestra."

Black Crystal is available from Camell Software of South of Cl. The game runs on a Sinclair Spectrum in 16 and 48K and on a Z801 in 16K.

BEWARE OF UNDERWATER ENEMIES

SUB TRACK

Sub Track is a new Spectrum version of an arcade game.

You command a destroyer being pursued by a fleet of enemy submarines. Your only defence is your depth charges which you must drop at just the right moment so that they will knock out the submarines a few seconds later as they pass below you.

Sub Track is manufactured by the new Spectrum writers — Amia Software of Cambridge.

Also in the range is an Adventure game called Treasure Hunt and a version of Pacman. The games cost £4.95.



WHEN IS A CASTLE A RIDDLE?

CASTLE OF RIDDLES

Most games do not offer this much as the software houses compete to sell their goods.

Seven goods worth £1,000 are up for grabs to the first person to solve the Castle of Riddles adventure for the BBC Model B.

The classic text-only adventure has an added level of funnour with such gems as "What gets wet as you get dry?" Answer: a towel.

The release date of Castle of Riddles has been strictly kept so that any one who purchases

the game, whether by mail order or over the counter, will have an equal chance of getting hold of the game at the same time and entering the competition.

Other exciting prizes planned for 1983 feature a number of holidays to far-away places. Most interesting of these is Automatic Cartography's trip to the U.S. to meet a mystery celebrity whose identity is hidden away in the bits and bobs of the new Spectrum game "My Name is Adolf Hitler, You Win a Fat Diger". Who can the celebrity be? Who will win the prize? Will the reporter be going to the U.S. to cover this momentous meeting? All will be revealed in Games News soon.

Another holiday — destination undecided — is to be put up by Camell Software of South of Cl for their next adventure game which will be the sequel to the new Black Crystal adventure.

A JOLLY MIXTURE OF FUN . . .

COMPENDIUM

These Pogo-Rogues of board games, the De-Luxe Compendium is now a thing of the past as all the family favourites such as Snakes and Ladders, Ludo, Fox and Geese, Battles, and more Noughts and Crosses can all be stored on one computer cassette.

The computer compendium

has a number of advantages over the traditional board version. It is impossible to lose the counters and the dice or other essentials to play as these are safely stored away on the cassette tape.

Furthermore, in a game like Noughts and Crosses for example, you can play against the computer if you are short of another human opponent.

A games compendium for the Sinclair Spectrum in 16K has been produced by Demand Software of Amersham. It features the above two games and is available from the Distributors based here at £4.95.

LAST REFUGE OF THE GALAXIANS

ARCADE CLASSICS

Arcade classics Galaxians and Defender are enjoying a new lease of life as games manufacturers regularly churn out versions for the popular micros.

Defender is one of the few video games to come out of the home period of 1980-81 to be still consistently earning top percentages in the local pubs and arcades.

In postwork it is probably now a little shabby but you can be sure that whenever a Defender machine is found there is also a small group of devotees regularly tending the humanoids.

The MicroBottle Jet Galaxians have not been quite so fortunate. Packed aside by Robotron, BurgerTime, Pacman, and more recently Pangloss — it now seems that British Rail buffers and here are the only rare places to find a Galaxians machine these days.

Whatever the future holds for these quaint old relics of the pre- or you-play games era you can still enjoy them as versions are now on sale for the BBC Model B, and Atari 400 and 800.

Cambridge based Acornsoft produce the games for the BBC machine — though sold under different names Planetoid to Defender and Accedans to Galaxians.

The Atari versions are available under the original names although the retail prices are not available as we go to press.



NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS

GAMES NEWS

GO TO WORK SMASHING AN EGG!

EXTERMINATOR

If you think with your wily winking *Star Trek*'s *The Bird* then you will be scared to lose when they are back. This team gaming set only for planet Earth but the entire universe!

You are charged with the mission of setting out the birds' secret lair on the planet Orin. This is where they lay their eggs and hatch their plot of intergalactic supremacy. The only way to stop the birds is to destroy their eggs.

Exterminator is the name of the game for the TRS-80 or Video Game. It can be purchased from Alpha Software at \$19.95.

Also new from Alpha this month is a 3D adventure game called *Double Agent*. You are the spy who must break in to a high security fortress and escape with top secret plans. The game comes with a money-back guarantee from the Bannock brand company at \$19.95.

SURVIVAL OF THE FITTEST AMOEBA!

EVOLUTION

Experience millions of years of evolution in a five-minute run this latest game for the Apple.

Only the strong survive in *Evolution* — sentiments which Charles Darwin would no doubt echo.

You begin the evolutionary cycle as an amoeba swimming in a tank of DNA cells which you must try to consume to reach your weak one-celled life form. Spores, microbes, and amoebas are also struggling for supremacy and will feed



on you if they can reach you.

If you survive the amoeba stage you then jump a few million years to become a frog. This time fish are your food source and kill your competitors.

From frog you go on to a toad, then leopards, then gorilla and finally human. The game does not end there. A final battle must be fought with the mutants followed by a nuclear war which could just spell doom for the human race.

Evolution was written by two Canadian teenagers who brought it into the offices of a Vancouver based business software house.

The firm liked it so much they decided to market it. And now the youngsters are predicted to be thousands of dollars better off by the end of 1983 according to the managing director of the company.

The game is produced by the Sydney Development Corporation — a Canadian business software firm. It is available in the countries from Palo Alto Computers at around \$20.

DOWN TO THE SEA AND SKY AGAIN

SUB COMMANDER

Submarine Commander and Junior Jet Pilot, the two TV advertised games from Thors \$9M for the Atari 400 and 800 will shortly be available for the Texas Instruments 594s.

The simulation games give you a taste of flying a *Jumbo* and commanding a submarine in war time. Both games feature a variety of realistic controls. *Submarine Commander* for example challenges you to destroy all enemy shipping operating in the Mediterranean.

You have vision to help you find them when submerged, radar, oxygen level, fuel, battery charge, depth under your keel, periscope and screen presentations of the surface and sky line, a map of the Mediterranean, and other screens.

The games will be on sale towards the end of January at around £35.

WIN YOUR COWBOY SPURS . . .

CHISHOLM TIRAL

If owners can look forward to a wider choice of games in the new year as some of the smaller software houses — currently manufacturing for the Vic, Spectrum, and BBC machines — are negotiating with Tiral to produce games for the Atari 800s.

The *Chisholm Tiral*

from Texas takes you back to the cattle trails of old Kansas with cowboys, wild steers and wranglers. For non High Chispaal fans a wrangler is a semi-trailer trailer employed by a local cattle herder to pick up the straps from your herd and then brand them with his own mark.

Chisholm Trail takes its name from the famous cattle trail between Texas and Kansas where many a cowboy earned his spurs. The aim of the game is to get your herd from Texas to Kansas with as few losses as possible.

The game is available from 13 dealers now at around £22.

THE GAME OF THE BOOK OF THE FILM . . .

1977

The game of the film is the latest craze in computer gaming. The theory behind it is that if people will play the book, record, I want and even play new parts of the film then why not buy the game of the film too.

The TV game centre manufacturers were the first into this profitable new business with games for current tax office money sponsors ET and Tron.

Not on the heels of *Star Wars* comes a version for the Spectrum in 198 and 800 from Automata of Southport.

ET has crash-landed on Earth and has lost his memory. It's up to you to help him remember his name, and find his space crab before the wild dogs and evil military catch him. *ET* is available to buy from the Harrowden firm.



BBC MICRO INSTANT MACHINE CODE!

Yes, it's true. Instant machine code from a good subset of BBC BASIC. Type your BASIC program into your model B BBC Micro, trigger the compiler, and your program is changed almost instantaneously into superbasic machine code. For £34.95 you get: Cassette version of the complete compiler (along with a version of the compiler for use with discs, ready for when you upgrade, the disc version being dubbed on the cassette after the cassette version); complete compiler listing; extensive documentation and instructions. The compiler was written by Jeremy Ruston.

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NEW PRODUCTS NEW PRODUCTS NEW PRODUCT GAMES NEWS

UP, UP AND AWAY WITH SPECTRUM

FLIGHT SIMULATION

By the way with this latest flight simulator from Pagan Software. The game is the most sophisticated flight simulator ever produced for a micro-computer.

It represented a marathon programming exercise for the London based firm. It took over eight thousand man hours to complete with up to six programmers working on the project at any given time.

Many of the features of this flight program are straight from the cockpit of a Boeing 747.

The instrument landing system uses up a flashing dot with a cross which has been centred on the chosen airport.

All information systems are displayed to slide just as in a real plane. These tell you your altitude, rate of climb, speed, wind and weather conditions, and your position.

The game offers two screen presentations. The first of these shows the view from the cockpit with the instruments described above in the bottom of the screen and the view of the horizon in the top half of the screen. As the plane swoops down you can see land and lakes in the horizon appearing in front of you through the cockpit window.

The plane can be made to bank, roll, dive, climb and even loop the loop — though you still have to be a pretty good pilot to make it do this.

The second screen presentation shows a map with your plane tracking its rate of progress. The airports are represented as flashing beacons with the land and lakes shown.

Flight Simulation runs on a Sinclair Spectrum in 1K, and is available from larger branches of W. H. Smith at £1.95.

Also new from Pagan this month is a second Heracle tape. The original Heracle game featured the cute comic character running around a path being pursued by the attendants. This was chasing him because the

mouthless little glutton had just grabbed their sandwiches and eaten their prize winning dainties.

In the second episode Heracle goes ski-ing. You have to get him across a busy road to the hut where he keeps his skis. Hebble back across the road with skis on and Heracle can then begin his slide down the snowy slopes. (Good luck Heracle! Don't fall over!

Heracle Goes Ski-ing runs on a Sinclair Spectrum in 1K or 4K, and is a W. H. Smith store now, at around £6.

GAME FOR A LAUGH ON THE ZX81

GAMES PACKS:

Two new games packs for the ZX81 add another thirteen games to choose from to the now enormous range of games available for the study of mice.

Both tapes run on the unexpanded machine in 1K.



NEWCOMER MEETS OLD FAVOURITES

DRAGON GAMES

A steady trickle of new game manufacturers are beginning to sell games for the new Dragon computer.

Games Pack One — from John Morrison of Stamford Street, Leeds, is an example of some of the new software now coming available. The cassette features five well known games: Othello, Avarit, Moonlander, Breakout and an original game, Reflex.

Reflex is a mini-adventure game where you have to explore a hazy world of mysterious rooms searching for treasure.

John Morrison also offers two classic adventure games: Staley and Warlock.

The above cassettes together with another Games Pack featuring Space Invaders, Lunar Lander, and a Commodore-type game are on sale now from the Northshire-based firm at £5.75.

Games Pack One features Air Sea Rescue, Invaders, Message Writer, Game Over, Breakout and Space.

Games Pack Two features Jump Jockey, Asteroids, Invaders (part 2), Star Cycle, Naughts and Crosses, Enterprise and Sketch.

Both games are available from Database Software of Stoke-on-Trent at £4.75.

DEFENDING THE BLUE DREAMWORLD OUTWORLD

The architecture of the city of Outworld is amongst the most beautiful in the galaxy. It's tall blue buildings tower up the sky.

The city is the only of central interior cases who seek to destroy it and deny the Subworlders their utopian life style.

Outworld's chief weakness is that it uses up vast amounts of energy to fuel the buildings and drive the protective force field which blankets the city.

You must provide an escort for the fuel ship and also fight off attacks from hostile aliens. Each time a meteorite hits the force field, more of the city's precious supply of energy is used up.

If an enemy vessel penetrates your defences they will then be able to score a direct hit on Outworld. It only takes one bomb from a barbarian ship to destroy the civilisation.

Outworld is the latest game from Reading based Audioforms for the Sinclair. The game is available at £4.95.

DON'T GET CAUGHT ON THE HOP!

FROGS

Wiggle Wiggle! Ho, my name is Froggy and I've just been hopped out of the arcade to become the latest game for the ZX81.

You can find me on the B side of the latest Pagan game called Super Crocker.

Froggy is a version of the popular arcade game Frogger in which you have to hop our hero to the safety of the bank on the other side of the river.

In Super Crocker you must point in as much of the maze as possible before the guards catch you.

Also new from Pagan this month and bringing a touch of arcade action to your ZX81 is Thru the Wall and Scramble.

Thru the Wall is a version of the early arcade hit Breakout.

Super Crocker and Thru the Wall are available from W. H. Smith at £4.95.

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Don't buy a TV game! Buy an Atari 400 personal computer and a game cartridge and that's all you'll need. Later on you can buy the Basic Programming Cartridge (BPC) and try your hand at programming using the easy to learn BASIC language. If you are interested in business applications, you can buy the Atari 800 + Disk Drive + Printer together with a selection of business software.

Silica Shop have put together a full catalogue and here you get details of all the peripherals as well as this extensive range of software that is now available for the Atari 400/800. This claim to now one of the best equipped personal computers. Send 01-301 for Silica Shop's catalogue and price list as well as details on our return club.

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— Pitfall Harry,
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Developed by David Crane.



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PRESTEL

THE SHAPE OF THINGS TO COME

Prestel, as you may know by now, was a marvellous idea to send constantly updated information down the phone wire.

A small adaptor was plugged into your office phone line, and it turned telephone signals into the right kind of weak electric currents which you could feed into the aerial socket of an ordinary T.V. set. And the hums and whistles which came down the Prestel phone wire reconstructed themselves into pictures on your screen — showing stocks and share prices, or railway timetables, or the day's latest newflashes.

Now I'm talking about all this in the past tense, because those particular uses of Prestel are rather fading into history.

THE HOOK . . .

Prestel never really caught on with people sitting round the telly at home because static screens of information look rather boring, and there was nothing much on Prestel that you couldn't find out by simply looking in a newspaper — which is far cheaper than the £300-£150 or so which the phone-line adaptors would cost.

But now there's a new home-orientated use for the Prestel idea: instead of just sending pages of information to read off your screen — like the BBC's Ceefax, or ITV's Oracle — it's possible to send home-computer programs down the wire. And to make it cheaper for everyone to hook up to the service, British Telecom and the publishers of Computer & Video Games, EMAP have got together to provide a £48.95 phone-to-computer adaptor.

IN THE NET . . .

Programs will be available from January on this new service — which is called Microset 800. "Microset" because it'll evolve into a network for microcomputers, and "800" because that's the number which existing Prestel users tap into

Peter Linton takes a break from our Prestel page this month as **EMAP 8400**. It brings you up to date on a brand new and exciting development — **Microset 800**.



their keyboard to get to the Microset area of Prestel.

The first few hundred programs on Microset 800 will be for the BBC A and B micros, the Apple computers, TRS-80s, KIM, 386/486 machines, and Commodore Pets.

Phone adaptors for these will be available straight away. And they'll be followed shortly afterwards by programs for the Sinclair machines, as Clive is due to make phone-to-Spectrums and phone-to-EEB1 adaptors available at the beginning of '85.

These adaptors are all (except for the Sinclair versions) what's called "acoustic modems" — acoustic means they operate by sound waves. So there's no direct attachment to the phone line; you just put your telephone receiver into the two plastic cups on the adaptor, and your micro and Prestel then talk to each other just like an ordinary human conversation.

This acoustic coupling cuts out the need to actually have British Telecom come round and add an extra "hard-wire" connection to

EMAP has come to a deal with Microsoft over games programs and any you send in for whatever reason, we will pass onto the Microsoft validation team. So, as well as testing your program published in EMAP, you'll have a chance of earning royalties from Britain's latest electronic magazine.

your telephone system. And it also means there's no chance of any unusual voltages jumping back and forth between your computer and the phone line.

The choice of programs seems extremely varied; there'll be educational programs to use in schools and colleges, games programs similar to Pacman and space invaders and then out of the home league there'll also be business programs.

Acornsoft have put some of their BBC programs onto Microset; Bug-Byte, Microdeal and Bridge Software are just some of the firms with EMAP programs on the system.

These programs — and all the others from major distributors — will cost far less on Microset than they do if you buy them in a shop or by mail-order.

There are also hundreds of free games on Microset, and the chance to win big prizes.

THE SYSTEM . . .

The whole idea of this programs-down-the-phone-line excitement came about through carefully evaluating what goes into a proper purpose-built Prestel receiver.

It has a screen — but so has a home computer; it has an alphanumeric keyboard — and so, too, does every personal computer.

Some Prestel sets, only have a numeric keyboard, and these can't be used for sending messages to other users. With a home computer you can type electronic messages to all or any other Microset users!

Home computers also have in-built memory, and cassette or disc recorders for storing information — so once a program has come down the line you can keep it for ever! That it was just one small logical step from using a home computer to process information, to using it to retrieve or receive that game-program information from a central Prestel or Microset computer.

Incidentally, Microsoft are paying a handsome 20% royalty on any programs of yours that they put on the system. Their address is: Peabody House, 37's Hatton Garden, London EC1N 8ED.

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TAMING THE INVADERS

David Langford discovers that there is more than just one way to save planet Earth

Once again those vile space invaders hang in the sky. Once again they threaten our way of civilization, and once again it's only your staggering marksmanship which can save Earth from being overrun.

Different, isn't it, to read these stirring words without suppressing a yawn? But there may be a new twist to the old game yet.

Since the days of H. G. Wells's *The War of the Worlds*, the trend in science fiction has been for our heroes not to expel the alien hordes on sight, but to try and establish some kind of communication.

For some strange reason games programs have lagged behind, perhaps because shooting space invaders seems more exciting, perhaps because it looks more difficult to program for communication.

We can keep the element of threat in a game of communication by remembering all those SF stories in which the latest misunderstanding leads to total and terrifying war.

In Joe Haldeman's novel *The Forever War*, it's just a small communication error which causes the thousand-year interstellar war between Us and Them.

A man in one of James White's stories tries to win the favor of cuddly aliens by kissing babies, but unfortunately the aliens assume that the Earthling carnivore is merely hungry.

Rather more subtle in *Peace by Ian Watson*, where war is provoked only when humans ask the aliens to agree to a peace treaty.

The aliens' reacting in, roughly, "If these humans are so barbaric and obsessed with war they need a special treaty to prevent them from lighting, it is clear that they are deeply in need of communication."

Back to the keyboard, imagine a program scenario in which an alien fleet advances slowly on you, waiting for intelligent signals but with its patience slowly dwindling, while the only weapon you have is some means of transmitting messages — plus, of course, your own gigantic intelligence.

This is a highly realistic situation, come to think of it. These are all the weapons most of us have against such barbarians as beings from beyond the solar galaxies as the Inland Nomads, the Post Office, Customs & Excise...

In the listing as given here, you can launch our signals to the alien hordes as fast as you like. Every so often another invader joins the fleet in the skies eventually they'll overrun you by sheer weight of numbers.

But when one of your messages is such that the aliens decide you may be



intelligent, they pause and retreat a little.

If you can message a whole series of "intelligent" signals to the invaders, then each successive signal will normally cause a bigger retreat until at last the sky is clear again — but a mistake may see you back to square one! It's up to you, then, to work against time and deduce what sort of simple messages can persuade the aliens to go away.

Beware: there are traps. Because aliens are deeply suspicious of mere repetition — you might only be a game — the same message will not work twice.

Obviously you can rewrite the program to change the type of intelligent signal for which it looks. A little study of the listing here will tell you the method used in my prototype program, though it won't help much if you want to cheat in any case! It's more fun to discover these things by playing the game than by analyzing the listing.

You could easily alter the program to make the key signal a particular computer-generated key word, so the game would become something like *Mattermost* or *Hangman* played against time. Or perhaps the aliens themselves could

be made to send signals, to which you have to respond, following alphabetical or mathematical sequences which you must get right? Or, ultimately, the computer could generate an artificial alien "language" in which they talk to you, your job being to decipher enough of it to send successful messages back... but perhaps the ideas are now getting a bit ambitious for a mere micro.

As usual, the listing is for a TRS-90, level II — but I'm buying another computer soon! As usual, you're encouraged to adapt the program to whatever other machine you may have — there are no particular subtleties.

Note that line 90 puts together the graphics for an invader. To make the game run faster, you can reduce the value of TR in line 808 — beginners may prefer to increase TM and slow the game down. To increase the playing time — after which the aliens take patience and aware over you — increase the value of K in the same line.

So once again the enormous fleet of space invaders descends the sky. Only you can save the Earth from being overrun. From deep in the armored command loop, you aim your mighty radio antenna and type: "Hello..."

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CHESS



Computers are well known to be weak at positional play, the intricate maneuvering for a small advantage, such as a well placed knight. However, they also have problems with tactical play, one with which seems like the simple task of finding forced checkmates in positions where they are known to exist.

Look at figure one. This is an example of a "White to play and mate in two moves" position of the kind often found in newspapers and magazines.

The first point to note here is that the specification for White to mate in two moves has no practical value. Chess problems are not game positions but artistic compositions on the 64 squares of the chessboard.

Solving a chess problem is not a matter of examining every possible sequence, but of identifying the computer theme in setting the problem.

The use of a computerized "mate in two" program using exhaustive analysis really underscores the aesthetic experience of problem solution.

Simply by considering every possible legal combination of two moves for White and one for Black, the program invariably reveals the winning move. (The reader is left to discover the solution for figure 1 using either a computer or a human brain, as preferred.)

In finding checkmating sequences in positions that arise in practical play, very different methods need to be applied.

The longest variation in a checkmating sequence arising from play can easily be 7 or 8 moves (of each side) deep, so analyzing every possible combination as a general sifting method is completely out of the question.

On the positive side, the moves in a checkmating sequence from play are usually fairly obvious ones of a forcing nature, such as checks and captures (at sacrifice of material) whereas those in composed problems are frequently "quiet" or unobvious moves, such as a bishop move one square further away from the scene of battle, which are difficult to perceive even for strong over-the-board players.

The MATER program of George Baylor and Herbert Simon which appeared in the mid-sixties was an early pioneering attempt aimed at finding forced checkmates in game positions, given that they are known to exist, or recently employing "Artificial Intelligence" rather than "brute force" means.

Figure 2 is a fairly straight forward example of the positions solved by the first version of the program, MATER 1.



The major difficulties with any such program are deciding what moves to consider and in what order, and at any point in the analysis deciding what to examine next.

Deciding when to stop analyzing a line is probably the hardest task of all. A really serious program might spend many hours, days, even longer, looking at variations beginning 1. P-QR3, Q-R2; 2. K-Q5, Q-B5; 3. P-N4, etc., which humans would discount at a glance.

MATER's choice of moves to examine is simple but works quite well. At any move for White (assumed to be the moving side), only checks are considered and at every White move preference is given to the check which leaves Black the fewest legal moves to reply.

As will be seen below, this may involve abandoning the current line of analysis and starting another.

Any White move which gives Black more than four legal replies are automatically discarded. Any remaining choice among White moves is resolved by giving priority to double checks, then to checks with no capturing replies.

When it is Black's turn to move, all legal moves must be considered, but there is a considerable advantage in looking first at those moves which are the most likely to refute White's attack.

For this reason, MATER looks first at Black moves which capture as valuable a White piece as possible. Where a still a choice, King moves get priority.

This is how the first 1700 solves the problem in figure 2.

1. Generate all White checking moves. 1. Q-B4ch has two legal replies, 2. B-A3ch has 3 and 1. B-B7ch and 2. B-A7ch each have one.

2. Choose 1. B-A7ch (arbitrarily) from the list for its analysis, on the basis of minimizing Black's replies.

3. Generate Black's forced reply 1. ... N-B3.

4. Generate all White's checking moves. 2. B-03ch is the only one and Black has three legal replies.

5. Choose a White move to examine next from those not yet considered. Candidates are 1. Q-B4ch (two replies), 1. B-A3ch (three replies), 1. B-B7ch (see reply) and 2. B-A3ch (three replies).

The best one is 1. B-B7ch as the previously played moves (1. B-A7ch, N-B3) are refuted and 1. B-B7ch is played instead from the original position.

6. Black's move is again forced. 1. ... N-B3.

7. Generate White's checking moves. 2. B-03ch (four legal replies) and 2. Q-B4ch (two replies).

8. Choose a move to consider next, from 1. Q-B4ch (two replies), 1. B-03ch (three replies), 2. B-A3ch (four replies) and 2. Q-B4ch (two replies).

Since 1. Q-B4ch was generated first, it is chosen in preference to 2. Q-B4ch (with two legal replies). So 1. Q-B4ch is now played in the original position.

9. Black now has a choice of two replies 1. ... N-B3 and 1. N-B2. The capture 1. ... N-B3 is best first.

10. Generate White's legal moves; these include 2. B-B7 mate, which has no legal replies at all and is accordingly chosen in fact at next.

11. Since 1. ... N-B3 was unsuccessful, Black's only other legal reply for 1. Q-B4ch is tried, namely 1. ... N-B2.

12. Generate White's legal moves; these include 2. B-A3ch which has no legal replies and is chosen in preference next. Since it has now been found that neither 1. ... N-B3 or 1. ... N-B2 mate checkmated, White's winning first move is established to be 1. Q-B4ch.

Although figure 2 is quite a simple position and one that, in isolation, could have been solved by an exhaustive "mate in two" program, the same method embodied in to consider other forcing moves as well as checks for White can solve many other problems for which an exhaustive search method would be completely inadequate in any reasonable amount of time.

BY MAX BRAMER



Remember, dear readers, in the last issue the BUG'S computer enraptured by TOTAL ANIMATION COMMANDS, leapt from the table and crashed to the floor. NOW READ ON...



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ARCADE

SAVING THE MACHINE ASSEMBLER

BLUEPRINT

What's got a machine, a monster and a beautiful maiden in distress. *Blueprint* — that's what.

This latest deviation on the maze game theme is a novel new video which may pickup some followers beyond the arcade once they get the hang of just what it's going on.

You, the player, control a little chap known as J.J. His job is to assemble a machine which once switched on will save Olive Damsel from the clutches of Ooze Gorg.

All J.J. has to do is collect all the parts of the machine from little houses situated in a sub-



urban maze, and build them into a "blueprint" at the bottom of the screen. At the top of the screen Olive Gorg mercilessly chases Daisy — getting closer as you play.

If J.J. enters a house more than once he comes out with more than he bargained for — a ticking bomb. This he must get rid of before it explodes — hopefully down Olive's monster hole after-

ward at the bottom right hand side of the screen.

The bombs prevent Olive's monstrous maids from engaging in the annoying habit of nipping out and bouncing up and down creating a quake which shakes your machine to bits and gives you the assembly job all over again.

There are other dangers for J.J. to overcome, Olive's maids, Swoaky Peter and Fuzzy Wuzzy appear to chase him around the maze and prevent him completing the machine and saving Daisy.

If J.J. manages to get all the parts in the right place and gets to the machine's on switch then a deluge of beach balls are fired at Olive — and if he is hit the story ends happily.

All in all it's a nice game — but you'll need a good few cracks at it before you get the drift of *Blueprint*.



You've heard of the game of the film — now see the film of the game.

Well, actually it's a video cartridge of a film which seems to have drifted into obscurity after playing second-fiddle to a horror movie while out on general release recently.

Called *Arcade Attack* it's an interesting semi-documentary concerned with the battle between the merits of pinball and video machines.

There's a lot of classic shots of pinball machines — many loaned by Pinball Owner's Association members — and a fascinating interview with an ace Defender player, who regards the *Scavenger*, *Midnight* and other games which inhabit this video game as sentient beings.

And finally a charming animated section at the end of the video film which depicts characters from pin table designs fighting it out with video-inspired aliens. £15 for 28 minutes.

THE SEA-SCAPE WITH A 3D FEEL

The third dimension is the current plaything which video game companies are flirting with.

Moving on from the 3D look of *Jaxxon-3D*.

This space and sea warfare comes as a stand-up cabinet and a cockpit, like *Rattle Zone* you have to watch the game through a small binocular eye panel which opens out onto the main screen.

You look out on a seascape filled with futuristic shipping tanks and a sky inhabited by

SUBROTC-3D

flying saucers and speeding space ships.

The action appears to you as though you are looking through the cockpit of your *Subroc* fighter and the screen reacts to your tugs on two handles which pop out periscope-like from the eyepoint.

A fire button lets you reply to the barrage of fire which your ship is undergoing as all sorts of bombs and missiles are hurled towards you. Torpedoes fired through the ocean while rockets fall to the skies.

The ultimate challenge is the flying *Command Ship* with its awesome firepower and protection shields.

Stereo sound adds to the effect and so do changes in the music to show day and night, dawn and dusk backdrops to the action. I found my initial response to be one of confusion, but *Subroc-3D* is undoubtedly the shape of games to come.

DUAL AERIAL DUELS

Take to the air on an attack, armed with a lance and battle with a band of buccard-mounted evil-doers.

Joust takes place in a realm of sheer fantasy and its brand of peculiar aerial combat takes place between either one or two players and the machine.

Dual controls for the duellists encourage the two-player version as higher scores are possible when the players take part in tandem against each other and the machine itself.

Mounted on either an ostrich or a stork, each player uses a long button and a joystick. He flies his bird towards the enemy others and attempts to unseat them.

A successful *Joust* scores points and turns the enemy into

JOUST

an egg which must then be picked up before it hatches into an even more deadly opponent.

The *Jousts* take place between suspended outcrops of rock over which the combatants flap. Other features include a deadly paradoxical which swoops down to engage the players, fire consumes the rock bridges leaving less space to land, and a lava trail takes shape, reaching up to grab anything which flies over its den.

The second, seventh, 12th — and so on — waves are termed *Serrated Waves* where players are rewarded for not losing ridges and every fifth wave is an egg wave with extra points to be won. Weird and wonderful.



ACTION

GAPPING GUIDELINES

Outline encourages you to improve rapidly as you learn your way around its many cautions.

Remember that the sparks travel at the same speed you do and when only one is on your trail there should be no problems if you keep moving. He can't catch you up and you can't get trapped anywhere.

Outline offers a joystick and a "gap" button as the controls. The joystick takes some getting used to because it needs constant pressure to keep moving. While the gap button should not be used for the first few screens as it only complicates matters.

Like all maze-games, once you have got a procedure for beating each screen, you should memorize it and stick with it.

Gapping breaks the line behind you but in corners it can lead to problems as you can gap yourself in behind two barriers. The gap lasts for several seconds before the diagram completes itself again.

It is possible to start at different levels in Outline but scores and practice suggest it is best to start from the first level. This presents you with a "T" like shape and a single spark. Memorize the spark's early movements and learn just what to expect.

Beating bonus scores can tempt you off your chosen path and into trouble but are worth three times the score.

The second screen "T" shape only threatens in the long central leg of the "T" where a careless player can get trapped.

The third diagram is the simplest, an "X" shape consists of five squares connected by one solitary line. The best method is to begin at a corner square and when the spark follows you up, leave with a gap behind you,

OUTLINE TIPS:

stranding the spark in the corner.

The fourth diagram resembles a distorted "M" and the problems are increased by a second spark. These have a nasty habit of trying to trap you down one of the long legs of the "M".

When sparks are after you, they tend to follow the "L" corridors first, so a staggered pattern will often cause the spark to career along a horizontal line above you rather than following you down it.

Another way to take advantage of the spark's on "U" turn policy is to follow behind it.

Wall five features a large gap covering the whole screen with two sparks. The time bonus will often beat you on this wall.

If you do, then it's back to the "X" shape with two sparks and then into a distorted "M" with two sparks which fire faster-moving missiles at you.

The game progresses through the maze firing screens into invisible mazes which only show the scores, not the lines. At wall 13 you are introduced to the mazes which can hide you from the sparks and in the final wall, No. 20, a super fast spark adds to the problems.

A CAST OF MINNOWS

Angler Dangler gives every fisherman a chance to see the one that got away.

This fishing game sets you down on a bank with rod and line and a rough idea of where that big fish might lie.

The indication is given on a radar screen which runs the length of the lake and the big fish flash up on it so they remain between the banks of reeds.



QUEST FOR THE RED PLANET

GRANTAR

How did you ever intergalactic cruise through Grantar's deepest space is the quest for the Red Planet.

Your mission is to collect fuel from the minor planets in the solar system and then storm the Red Planet via its subterranean passages.

Grantar is a new concept in laser landing games as it shows you progressively closer pictures of your approach to the planet.

A CAST OF MINNOWS

ANGLER DANGLER

Angler Dangler bristles in and down beside the radar screen and this represents the current length of your cast. By casting as the pointer passes over a fish, you should be able to deliver a hook to the best part of the lake.

The small size toddlers are fast to react but you can give the larger specimens a better chance of being first onto your hook by pulling it towards him.

With a toddler on your hook you may decide to cast again by losing the fish in the reeds.

But if you have attracted a real monster then the light begins, straining him around any obstructions, watch the fish tension as he fights and you reel in.

The landing of these large specimens can be quite hard, and you only have so many hooks...

In deep space your only worries are the Death Star — which will try to pull you into its field of gravity — and two pursuing craft sent after you by the Red Planet.

If any of these ships should come too close, the screen arranges to allow you both to manoeuvre in a daylight.

Arriving at a planet, you screen changes to show a close up of your craft descending. See the features of the planet are discernible. These include rocky mountains, usually studded with red bunkers which protect the blue fuel cells.

Taking care to avoid the bunkers' fire, you must manoeuvre over the fuel cell, and switch on your tractor beam to fit up with fuel.

The tractor button doubles as a shield button to help you repel enemy fire but each time you use it or the thrust button, fuel is depleted.

Points are scored for successfully landing a planet in the given time limit, destroying enemy bunkers, collecting fuel and stopping red ships.

The Red Planet challenges you to guide the ship down into a spiral cavern where a clock ticks down on a reactor. Having survived the tunnel journey you must blast the reactor and escape from the tunnel, all in under 23 seconds. If the mission is successfully completed, you are taken through to another universe.

Grantar resembles Asteroids in design and controls. With single lines representing planet surfaces, ships and planets. The controls are buttons for left and right rotation, fire and thrust buttons and a dual purpose, shield/tractor beam button.



Take-off for far away places with strange sounding names at the controls of a giant jumbo jet.

Will you be able to pilot the huge jet and land it safely? You'll

soon know once you've programmed in this flight simulation which will test your skills to the limit.

By gradually lowering your speed and altitude you have to

achieve a safe landing in five sequences. The computer will ask you for the relevant instructions as your run-in to the airstrip. Lowering your airspeed of altitude by too much will

cause the jet to stall.

Can you keep the jet and your passengers on the straight and narrow?

There are two skill levels and impressive graphics to enjoy.





Don't bother guessing which programs our members are saving money on this month.

If you use a BBC, Dragon, Spectrum, VIC or ZX81 computer and you are not yet a member of THE MICROCOMPUTER SOFTWARE CLUB, then only those with the VIC can be forgiven. We have only just added the VIC to our coverage.

Membership of The Microcomputer Software Club would save you money and trouble. Each month we thoroughly test and evaluate the many programs issued by the growing number of producers (including First, UK, BugByte, A & F, Complot, C-Tech, and the smaller companies that you may find it difficult to keep track of. If a program is good, and it has got to be very good, it is recommended to our members in the next issue of the Newsletter.

All the programs that we recommend are made available to our members at very low prices. For example, a BugByte program usually costing £10.00 would be offered to members at £9.00 or less. A saving of at least 10%. Every month we select what, in our opinion, is the overall best program for each computer and this MAIN CHOICE program is offered to members, for one month only, at an average 20% less than the normal price. A MAIN CHOICE program usually costing £6.00 would, therefore, be available to members at about £4.80.

Every month members receive, free of charge, our Newsletter full of information on the programs we have found suitable for recommendation. The range is large, including adventures, arcade, standard games, humanities, financial, educational, wordprocessing, and utilities. Ordering from the Newsletter is simple and quick and, of course, quality is guaranteed.

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Membership is completely free of charge, and receipt of the Newsletter is automatic. Members are under no obligation to purchase a fixed number of programs from the Club. They buy what they want when they want in the full knowledge that they are buying the best programs at the best prices. So, if you own or use a BBC A or B, Dragon, Spectrum (both revisions), VIC (expanded or unexpanded), or ZX81 (16k), join the Club. It will cost you nothing, and save you a lot.

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As a member I will receive the Club Newsletter free of charge and will be entitled to borrow from any spares offered to members on selected programs for microcomputers. I may cancel my membership at any time.

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P.O. Box 186, Oxford, OX2 9BA, England.

NAME

ADDRESS

CITY

POSTCODE SEE BT code 10

COMPUTER MODEL COMPUTER NAME

SIGNATURE


```
2700 PRINT#9#L LEFT;"[f]v:0000"
2710 PRINT#9#R SPEED;"[f]v:0000"
2720 PRINT#9#L ALTITUDE;"[f]v:0000"
2730 PRINT#9#R ENGINE SPEED BY 7 KNOTS*IMPER.
2740 GOTO 2750
2750 IF 118800000/((R-RMIN)/RMAX)*90000 < 274000
2760 IF 118800000/((R-RMIN)/RMAX)*90000 > 274000
2770 IF 118800000/((R-RMIN)/RMAX)*90000 < 274000
2780 IF 118800000/((R-RMIN)/RMAX)*90000 > 274000
2790 PRINT#9#R ALTITUDE BY 7 FEET*IMPER
2800 GOTO 2810
2810 IF 118800000/((R-RMIN)/RMAX)*90000 < 274000
2820 IF 118800000/((R-RMIN)/RMAX)*90000 > 274000
2830 PRINT#9#L
2840 GOTO 2850
2850 IF 118800000/((R-RMIN)/RMAX)*90000 < 274000
2860 IF 118800000/((R-RMIN)/RMAX)*90000 > 274000
2870 PRINT#9#L
2880 PRINT#9#R
2890 PRINT#9#L
2900 PRINT#9#R
2910 PRINT#9#L
2920 PRINT#9#R
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2970 PRINT#9#L
2980 PRINT#9#R
2990 PRINT#9#L
3000 PRINT#9#R
3010 PRINT#9#L
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3120 PRINT#9#R
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3190 PRINT#9#L
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3590 PRINT#9#L
3600 PRINT#9#R
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3600 GND*
3670 IP: 3HT48G0T00000
3680 PRINT "ALTIMETER ALTITUDE BY 7 FEET"IMPDT
3690 IP: 3HT48G0T00000
3700 GND*
3760 IP: 3HT48G0T00000
3790 GND*
3820 GND*
3830 PRINT " "
3840 PRINT " "
3850 PRINT " "
3860 PRINT " "
3870 PRINT " "
3880 PRINT " "
3890 PRINT " "
3900 PRINT " "
3910 PRINT " "
3920 PRINT " "
3930 PRINT " "
3940 PRINT " "
3950 PRINT " "
3960 PRINT " "
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3960 PRINT "YOUR PILOT SAYING IS "IT IS"
3970 PRINT "PERFECT"
3980 PRINT "BEFORE TAKE OFF IS VERY GOOD"
3990 PRINT "BEFORE TAKE OFF"
4000 PRINT "GOODBYE TO YOU"
4010 IP: 3HT48G0T00000
4020 IP: 3HT48G0T00000
4030 PRINT " "
4040 PRINT " "
4050 PRINT " "
4060 PRINT " "
4070 PRINT " "
4080 PRINT " "
4090 PRINT " "
4100 PRINT " "
4110 PRINT " "
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7100 FORWARD+44
7110 FORWARD+44.12
7120 FORWARD+44.20
7130 FORWARD+44.28
7140 FORWARD+44.36
7150 FORWARD+44.44
7160 FORWARD+44.52
7170 FORWARD+44.60
7180 FORWARD+44.68
7190 FORWARD+44.76
7200 FORWARD+44.84
7210 FORWARD+44.92
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8000 FORWARD+44.99
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BY R. M. STEVENSON

Golf

RUNS ON A BBC MODEL B IN 32K

"Faree! Ah, hello old chap. Out for a spot of golf than eh? Wonderful sport, what! Lots of fresh air and exercise. But sometimes you will find yourself stuck in the office for an afternoon. Or the weather will be so absolutely foul you won't be able to even lift a club for days!

That's where these computer chuggies come in useful. They've got golf off to a tee on the old screen. Jolly good when you can't get down to the links... oh, excuse me, jolly old ball seems to have got lodged in the branches of that pine tree. Bye for now!"

This program includes all the elements of the real game. Swings, greens, and even the dreaded "rough". You can tell the computer how many holes you wish to play and it will set the course for you.

It will ask you which direction you wish to make your shot to the green, and how hard you wish to hit the ball. The direction is calculated from 0 to 12 on the basis of a clock, and strength by entering a value from 0-100 which will represent the distance the ball travels in yards.

If you get into the trees you incur a penalty shot. If you get stuck in the rough you will adjust your hitting power up to five times more than normal. If you land in a bunker you'll need to Good luck, good hitting, and we'll see you back at the clubhouse!

The following alterations are required to run the program on a model B machine.
Change line 10 and 110 to read **MODE 4**. Change line 115 to read **COLOUR 1**. In lines 120, 121 and 122 remove all the **COLOUR** statements and the values immediately following it.

In line 1028 remove the **COLOUR 0** statement and the value immediately following it.
Change the **MODE 1** and **COLOUR 1** statements in line 1340 to read **MODE 4** and **COLOUR 1** respectively.

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MYSTERIOUS ADVENTURES



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4. **ARROW OF DEATH (Pt. 2)** — You now have the means to destroy your enemy ... but you are far from home and this land is strange to you. Can you cope with the deadly perils which approach you and have you the strength to see your mission through to the final conflict?
5. **ESCAPE FROM PULSAR 7** — Alone on a gigantic Space-Freighter ... The rest of your crew have died horribly at the hands of a mutated Zoo-Spiderman. Your only chance of escape is to reach the First Shuttlecraft. But the lurking Monster is hungry and you are the only food it has left ...
6. **CIRCUS** — Your Car has run out of Petrol on a lonely road miles from habitation. As you fudge reluctantly down the road in search of help you are suddenly confronted by an amazing sight ... in a nearby field is a huge Circus tent! But this is no ordinary Circus as you will soon discover ...
7. **FEASIBILITY EXPERIMENT** — Far across the gulfs of time and space, a dying race of super-intelligent beings search the Universe for a Hero to save their existence ... At length their thoughts turn to planet Earth. You are chosen to be their saviour in a bizarre scenario where death is a mere thought away ...

* Adventures 5, 6 and 7 require 32K RAM.

Each adventure comes attractively packaged for just 58.95 inc.

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FOR THE YEAR 1985
ASSETS 1000000
LIABILITIES 500000
EQUITY 500000

STATEMENT OF INCOME
REVENUE 2000000
EXPENSES 1000000
NET INCOME 1000000

STATEMENT OF FINANCIAL POSITION
ASSETS
CURRENT ASSETS
CASH 1000000
DEBTORS 500000
TOTAL CURRENT ASSETS 1500000
FIXED ASSETS
PROPERTY PLANT & EQUIPMENT 1000000
TOTAL ASSETS 2500000
LIABILITIES
CURRENT LIABILITIES
DEBTORS 500000
TOTAL CURRENT LIABILITIES 500000
EQUITY
CAPITAL 2000000
RESERVE FUND 500000
TOTAL EQUITY 2500000
TOTAL LIABILITIES & EQUITY 2500000

STATEMENT OF FINANCIAL POSITION
ASSETS
CURRENT ASSETS
CASH 1000000
DEBTORS 500000
TOTAL CURRENT ASSETS 1500000
FIXED ASSETS
PROPERTY PLANT & EQUIPMENT 1000000
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EQUITY
CAPITAL 2000000
RESERVE FUND 500000
TOTAL EQUITY 2500000
TOTAL LIABILITIES & EQUITY 2500000

BY STEPHEN SHAW

POMPEII

RUNS ON A T.J. 99/4 OR 99/4A IN 16K IN EXTENDED BASIC

In the ashes of Pompeii, the ancient Roman city devastated by a volcano, some gaming counters, in the shape of trussed up chickens, were found.

There appear to have been 12 counters in a set with Roman numerals I to XV on one side and the other blank. Historians think that they may have been used with a box with 12 compartments.

Stephen Shaw has delved back into history for this latest brain-teasing program — based on an adaptation of the ancient Roman game produced by Whitbread of Worcester.

Rules of the game are included in IAA&A statements in the program and, says Shaw, should be sufficient for play.

Program notes

- 120: Screen program in case of screen-corrupting system errors. You are advised on boot to hit CTRLN when the program has proved to be running OK. Otherwise you miss the error messages.
- 140: Warning messages are not displayed — the program will continue. BREAK is not totally disabled but can only be used when the machine is waiting for an input.
- 180: Defines flagbits 000-100 in the horizontal and vertical lines of the grid and the connecting points (192).
- 210: VALIDATE will only permit you to enter a Y or N. If you just press ENTER an N is assumed in this prog.
- 240: Draw 4 horizontal lines
- 250: Draw 5 vertical lines
- 270: Put a + in where they join
- 280-300: Put the numbers 1-12 in the boxes
- 320: Display the counter numbers on the left hand side of screen
- 330-340: General screen information
- 350: CT (X,Y) = numbered side of counter
- CT (X,Z) = blank side of counter
- CTR (X,Y) = result of throw
- CTR (X,Z) = has counter been thrown this round?
- Both and X,Y and only Z are here set to record the result of the throw, which is then displayed.
- 1 For other computers use CTRL(X,1)-(CT) (X):
- CTRL(X,1)-(CTR(X,1)) if you don't have multiple arguments
- 360: Tell comp all compartments are free for use.
- 380: When necessary change the player (P).

- 430: Check to see if counter can be used
- 450: If only one counter is to be used check to see if compartment can be used.
- 500: Tells computer the compartment has been used and deletes the compartment number from the screen. Arrays RPO (X) and COX (Y) contain the screen locations of the compartment number X, 000-050. These counters COX0 & TWR0 as appropriate if they cannot be used.
- 600: Have all leaving counters been used (all on TOP=0).
- 620: Randomise any counters which have not yet landed number up in this round.
- 700-720: Have 900 counters landed face up this time? Their scores ...
Scoring routine—total value of unlanded leaving counters, goes to TCV while total value of unlanded compartments goes to TRS.
- 740-800: If only one score exceeds 900 and player 2 has just completed a round (removes an disadvantage to player 1) then evaluate the scores.
- 850-870: Find scoring & evaluation.
- 900: Run again — if you do not have 90/50 as a constraint then reset scores to show end use GETTER 1000.
- 920: If elevated pressure has been selected but is not connected or switched on, this flag will send you to 1000 for a message and then you will go back to the initial selection of line 920, otherwise life would be difficult! The error line is amended then in line 940.
- 1010: Ensure you do not have continuous scrolling past one screen at a time.



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SCORES: NEMERA 30
TERRY 0

PLAYING: NEMERA

WHICH COUNTERS?
 1 2 3 4
 5 6 7 8
 9 10 11 12
 ENTER ZERO TO TERMINATE
 USE . IF ONLY ONE # IS USED

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1	2		4
5	6	7	
9	10		

SCORES: NEMERA 30
TERRY 40

PLAYING: NEMERA

WHICH COUNTERS?
 1 2 3 4
 5 6 7 8
 9 10 11 12
 ENTER ZERO TO TERMINATE
 USE . IF ONLY ONE # IS USED

```

100 REM
110 REM POMPEII - FOR 99/4
IN EXTENDED BASIC BY S
STEPHEN SHAW © 1982
120 DN ERROR 130
130 CALL CHAR(104,"FF00B000000000
OFF017D417D057D01FF")$J5 LOGO
140 DN WARNING NEXT :: DN BREAK
NEXT
150 CALL CLEAR :: RANDOMIZE :: D
IN CT(15:2)+CTR(15:2)+BK(12)+RR(
12)+CC(12)
160 DISPLAY AT(2,10):"POMPEII" :
: P=1
170 DISPLAY AT(4,1):"FOR 99/4 BY
STEPHEN SHAW"
180 CALL CHAR(100,RPTS("0",14):"
FF"&RPTS("01",8)&RPTS("01",7):"F"
F")
190 CALL HCHAR(6,15:104):: CALL
HCHAR(7,15:105)
200 DISPLAY AT(18,1):"WOULD YOU
LIKE INSTRUCTIONS?" :: DISPLAY A
T(19,10):"Y/N"
210 ACCEPT AT(19,15):BEEP SIZE(1)
VALIDATE("YN"):P=
220 IF AN="Y" THEN 300 ELSE 1000
230 REM SET UP / PLAY FM 240
CONT FROM 340
240 CALL CLEAR :: FOR R=2 TO 11
STEP 3 :: CALL HCHAR(R,16,100,16
)::: NEXT R
250 FOR V=15 TO 31 STEP 4 :: CAL
L VCHAR(3:V,101,90):: NEXT V
260 CALL HCHAR(1,12,104):: CALL
HCHAR(2,12,105) LOGO
270 FOR R=5 TO 11 STEP 3 :: FOR
V=15 TO 31 STEP 4 :: CALL HCHAR(
R:V,102):: NEXT V :: NEXT R
280 FOR R=1 TO 4 :: CC(R)=13+4*R
:: RR(R)=4 :: CALL HCHAR(4,CC(R
)+1,R+48)
290 CC(R+4)=13+4*R :: RR(R+4)=7

```

```

:: CALL HCHAR(7,CC(R+4)+1,R+52)
300 CC(R+8)=13+4*R :: RR(R+8)=10
:: NEXT R :: CALL HCHAR(10,10,5
7):: CALL HCHAR(10,21,49):: CALL
HCHAR(10,22,48)
310 DISPLAY AT(10,23):SIZE(2):"11
" :: DISPLAY AT(10,27):SIZE(2):"1
2" : BOARD DRAWN & NUMBERED
320 FOR X=1 TO 15 :: DISPLAY AT(
X,1):SIZE(3):USING "##":X :: NEX
T X
330 DISPLAY AT(13,10):"SCORES:"%
P+(1):: DISPLAY AT(14,17):P+(2):
: DISPLAY AT(13,26):STR$(SCORE(1
)): : DISPLAY AT(14,26):STR$(COR
E(2))
340 DISPLAY AT(16,10):"PLAYING:"
350 FOR X=1 TO 15 :: CT(X)=X*% :
CT(X,2)=0 :: CTR(0,1)+CTR(0,2)
=CT(X)INT(60*(2+1)):: DISPLAY AT
(X,4):SIZE(2):USING "##":CTR(0,1)
:: NEXT X
360 FOR X=1 TO 12 :: BK(X)=% ::
NEXT X
370 DISPLAY AT(21,1):"ENTER ZERO
TO TERMINATE"
380 IF TOT=0 THEN 390 :: CALL SD
UND(660,660,0):: P=P+1 :: IF P=3
THEN P=1 : CONTINUE PLAY FROM H
ERE
390 DISPLAY AT(16,18):SIZE(10):P+(
0)
400 DISPLAY AT(24,1):"USE . IF O
NLY ONE # IS USED"
410 DISPLAY AT(18,1):"WHICH COUN
TERS?" :: DISPLAY AT(19,1):SIZE
(32):"FIRST"
420 ACCEPT AT(19,7):BEEP VALIDATE
(0$):SIZE(2):ONE :: IF ONE=0 T
HEN 640
425 IF ONE=15 THEN GOSUB 1130 ::
GOTO 410
430 IF CTR(ONE,1) < ONE THEN DISP

```

```

LAY AT(19,1):"NOT AVAILABLE
  11 GOSUB 1130 11 GOTO 410
440 CTR(ONE,1)=0 11 DISPLAY AT(0
NE,4)SIZE(2)USING "##":CTR(ONE,
1)
450 DISPLAY AT(20,1):"SIGN? (+ -
OR ?)"
460 SSS="1" 11 ACCEPT AT(20,20)
EEP:SIZE(1)VALIDATE("+-,")SSS 1
470 IF SSS="+" OR SSS="-" THEN 460
480 IF SSS="." AND ONE=12 THEN C
ALL HCHAR(20,1,32,32)11 CTR(ONE,
1)=CTR(ONE,2)11 DISPLAY AT(ONE,4
)SIZE(2)USING "##":ONE 11 GOTO
410
490 IF SSS="." THEN 510
490 IF SSS="." AND BX(ONE)<ONE
THEN DISPLAY AT(19,1):"NOT AVAIL
ABLE " 11 GOSUB 620 11 GOSUB 1
130 11 CALL HCHAR(20,1,32,32)11
GOTO 410
500 IF SSS="." AND BX(ONE)=ONE T
HEN BX(ONE)=0 11 CALL HCHAR(0,0
NE)+CC(ONE)+32,2)11 CALL HCHAR(2
0,1,32,32)11 GOTO 410
510 IF SSS="+" AND SSS<"- " THE
N 410 1 SSS NOW= + OR -
520 DISPLAY AT(20,22):"%" 11 ACC
EPT AT(20,24)SIZE(2)EEP VALIDAT
E(DIGIT)TMD
530 IF TMD=15 OR CTR(TMD,1)<TMD
THEN DISPLAY AT(20,1):"TMD AVAI
LABLE " 11 GOSUB 1130 11 CALL H
CHAR(20,20,32,12)11 GOTO 520
540 IF TMD=0 THEN CALL HCHAR(20,
1,32,32)11 GOSUB 620 11 GOTO 410
550 CTR(TMD,1)=0 11 DISPLAY AT(CT
MD,4)SIZE(2)USING "##":CTR(TMD,
1)
560 IF SSS="+" THEN X=ONE+TMD 11
IF X=12 THEN DISPLAY AT(20,1):"
ONLY 12 DIGITS!" 11 GOSUB 620 11
GOSUB 630 11 GOTO 410
570 IF SSS="-" THEN X=ABS(ONE-TM
D)11 IF X=12 THEN GOSUB 620 11 G
OSUB 630 11 GOTO 410
580 IF BX(0)<X THEN GOSUB 630 1
1 GOSUB 620 11 DISPLAY AT(20,1):
"NOT POSSIBLE " 11 CALL HCHAR(
20,1,32,32)11 GOTO 410
590 BX(0)=0 11 CALL HCHAR(0,0)+
CC(X)+32,2)11 CALL HCHAR(19,1,32
,64)
600 GOTO 410
610 STOP
620 CTR(ONE,1)=CTR(ONE,2)11 DISP
LAY AT(ONE,4)SIZE(2)USING "##":
ONE 11 RETURN
630 CTR(TMD,1)=CTR(TMD,2)11 DISP
LAY AT(TMD,4)SIZE(2)USING "##":

```

```

TMD 11 RETURN
640 REM END TURN CALL USED
OR GIVE UP IN DESPAIR !
650 TOT=0
660 FOR X=1 TO 15 11 TOT=TOT+CTR
(0,1)11 NEXT X
670 IF TOT=0 THEN 750 11 SCORE
680 FOR X=1 TO 15 11 IF CTR(X,2)
=0 THEN CTR(X,1)+CTR(X,2)=CTR(X,
1)+(2+1)
690 NEXT X
700 FOR X=1 TO 15 11 DISPLAY AT(
X,4)SIZE(2)USING "##":CTR(X,1)
11 NEXT X 11 TEST=0
710 FOR X=1 TO 15 11 TEST=CTR(X,
1)+TEST 11 NEXT X
720 IF TEST=0 THEN 750 11 PERFECT
SCORE
730 GOTO 300 11 CONTINUE SAME PLAY
ER
740 STOP
750 TBX=0 11 SCORE SECTION
760 FOR X=1 TO 12 11 TBX=TBX+X(
X)11 NEXT X
770 SCORE(P)=SCORE(P)+TOT+TBX
780 DISPLAY AT(12+P,26)USING "##
##":STR$(TOT+TBX)11 TOT=-1
790 IF SCORE(1)>100 OR SCORE(2)
100 THEN 800 ELSE 280
800 IF P=2 THEN 820 ELSE 280
810 STOP 1====
820 CALL CLEAR 11 IF SCORE(1)>SC
ORE(2)THEN P=1 ELSE P=2
830 PRINT
840 PRINT P$(P)%" SCORE "%STR$(
SCORE(P))%" LOSER"11
850 P=P+1 11 IF P=3 THEN P=1
855 PRINT P$(P)%" SCORE "%STR$(
SCORE(P))%" WINNER"11 11
860 PRINT "ANOTHER GAME? Y OR N"
11 INPUT AS 11 IF AS="Y" THEN 8
00 ELSE IF AS<"N" THEN 840
870 STOP
880 SCORE(1)+SCORE(2)=0 11 RUN 1
880
890 STOP
900 REM INSTRUCTIONS HERE
910 REM PRINTER/SCREEN
920 CALL CLEAR 11 PRINT "PDP11
11: WOULD YOU LIKE THE OLD(S)
INSTRUCTIONS ON YOUR TV SCR
EEN/OR ON YOUR THERMAL PRINTER
?"
930 PRINT "ENTER TV OR TP:"
940 ON ERROR 230 11 INPUT AS 11
IF AS<"TP" AND AS<"TV" THEN 94
0
950 IF AS="TV" THEN 1040
960 REM AS="TP"-PRINTER-FIRST TE
STE-

```

870 ON EROR 2000
880 OPEN #4:TP,0,3,E,OUTRO1
890 IN#1 TO 300 #1 MOVE #3,1,
900 END THEN 1000
910 PRINT #3#4#1 NEXT #1,1,CR
920 CLEAR
930 RES=ND HOP
940 RES

950 GOSUB 1000
960 GOTO 1000
970 CALL COMND(300,400,1000,0)
980 WAIT #3,0,1,ENTER,1,0,0,
990 END

1000 REM *****
1010 REM *****
1020 REM *****
1030 REM *****
1040 REM *****
1050 REM *****

1060 REM *****
1070 REM *****
1080 REM *****
1090 PRINT #1:NAME\$;#4#3
1100 GOSUB 1110
1110 INPUT #1:ONE;#3:PT#1;
1120 IS LEV #3 THEN #10
1130 INPUT #1:PLAYER;#4:TP#2;
1140 IF #3<#1 THEN #110
1150 IF #3=#1 THEN #3

1160 GOTO 1110
1170 FOR #4=1 TO 700 #3 NEXT
COUNT:RETURN
1180 END

1190 DATA POMPEII, BY STEPHEN SHAW
1200 FOR TEXAS INSTRUMENTS 89-4 AND
89-44 IN EXTENDED BASIC

1210 DATA THIS GAME IS BASED ON
GAMES CHIPS FOUND AT POMPEII, A
1220 COPYRIGHT BY WHITTENBRAFT,
1230 DATA RULES FROM GAMES & PUZ
ZLES, OCTOBER, 1977, *****

1240 DATA THE BASIC GAME IS AS F
OLLOWS, THERE IS A BOX WITH TWELVE
1250 COMPARTMENTS AND FIFTEEN DOUB
LE SIZED COUNTERS, WITH ONE SIDE E
1260 END

1270 DATA THE OTHER WITH A NUMBE
R, THE FIRST PLAYER THROWS THE 1
3 COUNTERS AND MUST USE THE NUMB
ERS ON THOSE THAT FALL

1280 DATA NUMBER UP IN ACCORDANC
E WITH THE FOLLOWING RULES: *****
1290 DATA THE VALUE OF ONE COUNT
ER MAY BE USED TO "FILL" ONE COM

PARTMENT OF THE BOX TO CLEARS
E OF TWO COUNTERS *****
1300 DATA WHENEVER ALL COUNTERS
1310 INTERPAGE USED UP, THIS WHICH I
NTERPAGE WILL BURK UP THE COMP
1320 END AND PLAYER ONE CONTINUE
1330 DATA UNTIL HE DRAWS A COUN
1340 COUNTER OR NO COUNTER FROM THE

1350 *****
1360 DATA WHEN THE FIRST COUNTE
1370 COUNTER CONTAINS THE LAST
1380 OF ALL COUNTERS, THE GAME EN
1390 WITH AN END *****

1400 *****
1410 *****
1420 *****
1430 *****
1440 *****
1450 *****

1460 *****
1470 *****
1480 *****
1490 *****
1500 *****
1510 *****

1520 *****
1530 *****
1540 *****
1550 *****
1560 *****
1570 *****

1580 *****
1590 *****
1600 *****
1610 *****
1620 *****
1630 *****

1640 *****
1650 *****
1660 *****
1670 *****
1680 *****
1690 *****

1700 *****
1710 *****
1720 *****
1730 *****
1740 *****
1750 *****

1760 *****
1770 *****
1780 *****
1790 *****
1800 *****
1810 *****

1820 *****
1830 *****
1840 *****
1850 *****
1860 *****
1870 *****

1880 *****
1890 *****
1900 *****
1910 *****
1920 *****
1930 *****

1940 *****
1950 *****
1960 *****
1970 *****
1980 *****
1990 *****

**"We will be flying at a height of 30,000 feet.
Our air speed will be 500 knots.
And there's a fair chance we're going to crash."**





No smoking. Fasten your seat belt. You're about to take off in a 747. But on this flight you're the pilot.

You could hardly describe THORN EM's Jumbo Jet Pilot as simply another video game. It's more like a career in flight simulator with life-like instrumentation and graphics.



Available for IBM PC, Commodore 64, Amiga, Macintosh, and Atari. Includes manual, reference cards, and a flight simulator with life-like instrumentation and graphics. See your local software store for more information.

To cope you need to be alert. You should expect the unexpected. And you definitely shouldn't lower the landing gear when your air speed is dropping and the horizon suddenly appears vertical!

On landing, your in-flight computer will assess your skills and give a performance rating. If you manage to land that's a...

Jumbo Jet Pilot is one of 21 challenging, new home computer games from THORN EM. It's pretty demanding (but our programs aren't all work and no play).

"Star Trek", "Backback and Secret", and all action games. "Pool" and "Darts" will suit another quarter.

And while building Beethoven's play the VIC Music Composer, would be Charcoalton's job work on their budgets with Home Financial Management.



Darts



Backback and Secret

We also have educational puzzles for children that will puzzle adults of higher skill levels. But there's one simple idea behind all our titles: we've designed them for players who are bored with run-of-the-mill TV games.



Now is that Heathrow ahead? Or is it Hyde Park?

THORN EM

The world's greatest TV games



Available from all branches of Lakeside (Watsonville, Menlo Park, San Jose) and all other leading Computer software outlets.

```

1000 LET P=0
1001 GOSUB 3000
1002 LET MS="MINUTES"
1003 PRINT
1004 LET PY=0
1005 LET PX=0
1006 LET R=1
1007 LET D=0
1008 LET I=0
1009 LET J=0
1010 LET K=0
1011 LET L=0
1012 LET M=0
1013 LET N=0
1014 LET O=0
1015 LET P=0
1016 LET Q=0
1017 LET R=0
1018 LET S=0
1019 LET T=0
1020 IF P=1 THEN GOTO 6670
1021 PRINT AT PY:PX:
1022 PRINT AT PY+1:PX+1: " "
1023 PRINT AT PY:PX:MS
1024 GOSUB 1000:10:400:600
1025 GOTO 1000
1026
1027 LET T=T+1
1028 IF T=0 THEN GOTO 6000
1029 LET PY=PY+1
1030 LET PX=PX+1
1031 IF INKEY="" THEN LET PX=P
1032 IF INKEY="0" THEN LET PY=P
1033 IF INKEY="1" THEN LET PY=P
1034 IF INKEY="2" THEN LET PX=P
1035 LET Q=3000+10*PY
1036 GOSUB 0
1037 GOTO 3000
1038 IF PX=10 THEN LET PY=0
1039 IF PY=0 THEN LET PY=0
1040 IF PX=10 AND R=1 THEN GOTO
4700
1041 RETURN
1042 IF PX=0 THEN LET PX=0
1043 IF PX=20 THEN LET PX=20
1044 RETURN
1045 IF PX=0 THEN LET PX=0
1046 IF PX=20 THEN LET PX=20
1047 RETURN
1048 IF PX=10 THEN LET PX=10
1049 IF PX=20 THEN LET PX=20
1050 RETURN
1051 IF PX=11 THEN LET PX=11
1052 IF PX=19 THEN LET PX=19
1053 RETURN
1054 IF PX=10 THEN LET PX=10
1055 IF PX=19 THEN LET PX=19

```

Escape from the Pyramids of Mars

Mars hides many secrets beneath its silent shifting sands. Was there a happy intelligent ancient race which crashed on the planet in times long past?

You are a member of a team attempting to solve that mystery. You were on the verge of a great breakthrough after a mysterious pyramid was uncovered by excavations in one of the many Martian deserts — miles from the nearest earth colony. Your mission was to explore this newly unearthed structure.

But on entering you found yourself trapped in the interior of the pyramid. To escape you discovered that you needed four keys from the tomb's inner chamber. But you can only carry one key at a time due to a strange force which paralyzes them.

The corridors and key chamber are protected by defense mechanisms still operational after millions of years. And your air supply is running out . . .

BY DAVID HEALY

```

4994 RETURN
4995 IF PY<=13 THEN LET PX=13
4996 IF PY<=13 THEN LET PX=17
4997 RETURN
4998 IF PX<=14 THEN LET PX=14
4999 IF PX<=14 THEN LET PX=18
5000 RETURN
5001 IF PY<=18 THEN LET PX=15
5002 RETURN
5003 GOTO 4999
5004 GOTO 4999
5005 GOTO 4999
5006 GOTO 4999
5007 GOTO 4999
5008 GOTO 4999
5009 IF PY=17 AND PX<=15 THEN LE
T PY=18
5010 IF PY=17 AND PX<=15 THEN LE
T PX=16
5011 IF PY=18 THEN LET PY=16
5012 IF PY=18 AND PX<=15 THEN LE
T PX=16
5013 IF PX=15 THEN LET PX=1
5014 IF PX=15 THEN LET PX=2
5015 IF PX=15 AND M=1 AND R=0 TH
EN GOTO 4999
5016 IF PX=15 AND M=1 AND R=0 T
HEN GOTO 4999
5017 IF PX=15 AND M=1 AND R=0 TH
EN GOTO 4999
5018 IF PY=18 OR IM=1 OR IM=2 OR
IM=3 THEN RETURN
5019 RETURN
5020 LET M=1
5021 GOTO 4999
5022 LET M=0
5023 GOTO 4999
5024 LET M=1
5025 RETURN
5026 LET M=0
5027 PRINT AT 9,15:0
5028 LET M=1
5029 IF M=1 THEN GOTO 7999
5030 LET M=0
5031 RETURN
5032 PRINT AT 11,10: "M" : AT 11,1
0: " "
5033 IF PY=11 THEN GOTO 6999
5034 RETURN
5035 PRINT AT 11,10: "M" : AT 11,1
0: " "
5036 IF PY=11 THEN GOTO 6999
5037 RETURN
5038 PRINT AT 11,10: "M" : AT 11,1
0: " "
5039 IF PY=13 THEN GOTO 6999
5040 RETURN
5041 PRINT AT 10,10: "M" : AT 10,1
0: " "
5042 IF PY=13 THEN GOTO 6999
5043 RETURN
5044 PRINT AT 10,10: "M" : AT 10,1
0: " "
5045 IF PY=15 THEN GOTO 6999
5046 RETURN
5047 PRINT AT 10,10: "M" : AT 10,1
0: " "
5048 IF PY=15 THEN GOTO 6999
5049 RETURN
5050 PRINT AT 10,10: "M" : AT 10,1
0: " "
5051 IF PY=15 THEN GOTO 6999
5052 RETURN
5053 PRINT AT 10,10: "M" : AT 10,1
0: " "
5054 IF PY=15 THEN GOTO 6999
5055 RETURN
5056 PRINT AT 10,10: "M" : AT 10,1
0: " "
5057 IF PY=15 THEN GOTO 6999
5058 RETURN
5059 PRINT AT 10,10: "M" : AT 10,1
0: " "
5060 IF PY=15 THEN GOTO 6999
5061 RETURN
5062 PRINT AT 10,10: "M" : AT 10,1
0: " "
5063 IF PY=15 THEN GOTO 6999
5064 RETURN
5065 PRINT AT 10,10: "M" : AT 10,1
0: " "
5066 IF PY=15 THEN GOTO 6999
5067 RETURN
5068 PRINT AT 10,10: "M" : AT 10,1
0: " "
5069 IF PY=15 THEN GOTO 6999
5070 RETURN
5071 PRINT AT 10,10: "M" : AT 10,1
0: " "
5072 IF PY=15 THEN GOTO 6999
5073 RETURN
5074 PRINT AT 10,10: "M" : AT 10,1
0: " "
5075 IF PY=15 THEN GOTO 6999
5076 RETURN
5077 PRINT AT 10,10: "M" : AT 10,1
0: " "
5078 IF PY=15 THEN GOTO 6999
5079 RETURN
5080 PRINT AT 10,10: "M" : AT 10,1
0: " "
5081 IF PY=15 THEN GOTO 6999
5082 RETURN
5083 PRINT AT 10,10: "M" : AT 10,1
0: " "
5084 IF PY=15 THEN GOTO 6999
5085 RETURN
5086 PRINT AT 10,10: "M" : AT 10,1
0: " "
5087 IF PY=15 THEN GOTO 6999
5088 RETURN
5089 PRINT AT 10,10: "M" : AT 10,1
0: " "
5090 IF PY=15 THEN GOTO 6999
5091 RETURN
5092 PRINT AT 10,10: "M" : AT 10,1
0: " "
5093 IF PY=15 THEN GOTO 6999
5094 RETURN
5095 PRINT AT 10,10: "M" : AT 10,1
0: " "
5096 IF PY=15 THEN GOTO 6999
5097 RETURN
5098 PRINT AT 10,10: "M" : AT 10,1
0: " "
5099 IF PY=15 THEN GOTO 6999
5100 RETURN

```

```

5101 IF PX=20 THEN GOTO 8999
5102 RETURN
5103 FOR L=1 TO 30
5104 PRINT AT 8,15: "L" : AT PY,L
: "M" : AT PY,OK
5105 NEXT L
5106 FOR L=1 TO 30
5107 NEXT L
5108 CLS
5109 PRINT "YOU HAVE BEEN ARRESTED
BY THE POLICE"
5110 PRINT "OVERSEES SELF DEFENC
E MECHANISM"
5111 PRINT "GOOD JOB ITS ONLY A
GAME"
5112 PRINT "PRESS N/L FOR ANOTHE
R GAME"
5113 IF IM=1 OR IM=2 OR IM=3 THEN GOTO 6975
5114 LET P=1
5115 GOTO 699
5116 LET P=0
5117 GOTO 6795
5118 CLS
5119 PRINT "YOU HAVE SUFFOCATED
THROUGH
LACK OF OXYGEN. HARD
TO BREATHE"
5120 PRINT "PRESS N/L FOR ANOTHE
R GAME"
5121 IF IM=1 OR IM=2 OR IM=3 THEN GOTO 6545
5122 LET P=1
5123 CLS
5124 GOTO 699
5125 LET P=0
5126 GOTO 6795
5127 CLS
5128 PRINT AT 8,10: " "
5129 PRINT AT 9,10: " "
5130 PRINT AT 10,10: " "
5131 PRINT AT 11,10: " "
5132 PRINT AT 12,10: " "
5133 PRINT AT 13,10: " "
5134 PRINT AT 14,10: " "
5135 PRINT AT 15,7: " "
5136 PRINT AT 16,6: " "
5137 PRINT AT 17,5: " "
5138 PRINT AT 18,4: " "
5139 PRINT AT 19,3: " "
5140 PRINT AT 20,2: " "
5141 FOR L=1 TO 10
5142 NEXT L
5143 PRINT AT 20,10: " "

```





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PUCKMAN II

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Name _____

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7300 GO SUB 7400
7310 PRINT AT 20,10: " F
7320 GO SUB 7400
7330 PRINT AT 19,10: "
7340 GO SUB 7400
7350 PRINT AT 19,10: " F
7360 GO SUB 7400
7370 PRINT AT 19,10: "
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9990 PRINT AT 19,10: " F

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FROM THE

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9000 FOR V=1 TO 100
9010 NEXT V
9020 CLS
9030 PRINT "
9040 PRINT " YOU ARE A MEMBER
9050 PRINT " OF A SECRET SOCIETY
9060 PRINT " EXPLORATION PARTY AND
9070 PRINT " HAVE
9080 PRINT " EXCAVATED SEVERAL PY
9090 PRINT " STRUCTURES ON THE SU
9100 PRINT " SPACE OF
9110 PRINT " HERE."
9120 PRINT " UPON ENTERING YOU
9130 PRINT " FIND
9140 PRINT " YOURSELF TRAPPED IN
9150 PRINT " THE STRANGER
9160 PRINT " INTERIOR OF THE PYRO
9170 PRINT " TO
9180 PRINT " ESCAPE YOU MUST COLL
9190 PRINT " LECT
9200 PRINT " KEYS FROM THE INNER
9210 PRINT " CHAMBER
9220 PRINT " CARRY THEM TO THE DO
9230 PRINT " OR
9240 PRINT " PLACE THEM IN THE SL
9250 PRINT " CHAMBER
9260 PRINT " HOWEVER ONLY CARRY O
9270 PRINT " NE KEY AT A
9280 PRINT " TIME."
9290 PRINT " THE CORRIDOR AND
9300 PRINT " ARE
9310 PRINT " PROTECTED BY A DEFEN
9320 PRINT " CE MECHANISM
9330 PRINT " WHICH CAN KILL YOU I
9340 PRINT " F YOU
9350 PRINT " CLOSE WHEN IT IS OPE
9360 PRINT " N
9370 PRINT " REMEMBER THAT YOU
9380 PRINT " SUPPLY IS LIMITED, S
9390 PRINT " O
9400 PRINT " PRESS N/L TO CONTINU
9410 PRINT "
9420 IF IMEY=0 THEN GOTO 9700
9430 CLS
9440 PRINT "
9450 PRINT "
9460 PRINT "
9470 PRINT "
9480 PRINT "
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TANKER

RUNS ON A SPECTRUM IN 128

BY MORE LEVEL

A life on the ocean wave can be dangerous. There's always someone lurking around ready to blast your tanker right out of the water!

The object of this game is to knock out as many enemy tankers as possible using your anti-tanker gun — making sure that the vital supplies your warring opponent needs just don't get through.

To give those tanker captains that sinking feeling use keys "Z" to move left, "X" for right and "M" to fire.

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Let Commodore expand your horizons.

VIC 20 is the finest home computer that money can buy.

And the better you get to know it, the more confident, adventurous and ambitious you'll become.

You'll want to take advantage of the vast range of VIC software: a superb and constantly-growing selection of programs, embracing business systems, entertainment, education and many applications in the home.

Every program in the series has been designed by experts, and chosen for its quality and value for money.

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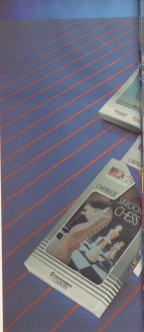
Learn subjects as diverse as English Language, programming, and biology.

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to add to your understanding and enjoyment of computers and computing.

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VIC 20



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Telephone: Slough (0753) 78192.

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VIC/VIC 20-40



"Computerized cramming! Whatever will they think of next? In my day we had to get out among the apple trees for a bit of fruity fun. And there was always the gameskeeper to keep an eye out for. If he caught you you'd know all about it! All these computerized chappies have to worry about is dropping apples!"

The game is set outside the tall ivy-clad wall of an orchard. You are waiting at the bottom of the wall holding a basket on your head. Your computer "accomplice" will throw apples over the wall at random positions. All you have to do is catch as many as you can.

When you have caught 15 apples the game stops momentarily and the computer tells you it has found something to help you. A traffic light is drawn on the screen and you hop up onto it. The game continues but you have less time to catch the falling apples.

The traffic lighting routine is continued each time you collect 15 apples in your basket, moving you progressively further up the screen, giving you less and less time to catch the falling fruit.

Once you have missed 10 apples the game stops and the computer tells you your score—a chance to have another crack at those apples!

Variables:

T₁: vertical position of basket.

T₂: vertical position of man.

X₁: horizontal position of basket and man.

APP: number of apples caught.

MISS: number of apples missed.

Q: limit of fall of apples in FOR/NEXT loop.

E: deterministic level change (increase by 15 each level).

R: random horizontal position of falling apples.

L: control flag (equals 1 or 10).

The "*" character is a clear screen command (BASIC, CBASIC) and it appears in lines 18, 108, 218.

Type line 2188 exactly as it is for correct screen format.

Lines 3450, 3470, 5100, 5120, 5140,

5160, 5240 should have the words

between quotation marks typed in

UPPERCASE letters.

Also lines 5010-5070 should have the

"s" typed in otherwise BASIC video. In

line 5238 type 21 CONFIRM, W's

underlining.



```

1 REM OVER THE ORCHARD WALL BY PETER & M
2000 MIGHTY MUGGET 1982.
3 SOUND 2660
4 @=79:Y=15
7 SOUND 2660:GOTO 26
8 SOUND 2660
9 7 "MIGHTY GOT 'EMPT' APPLES GO FAN"
12 IF APP=15 THEN 799
26 F0R 764,52:F0R 765,218:COLOR 1:PLOT
  6,15:DRAWTO 159,15
28 @=INT(RND*(1+200)+15):F0R 52776,6
29 REM MAIN PLAYING LOOP
36 F0R 2=18 TO 26:STICK=0
35 SOUND 6,2=11,18,6
46 COLOR 2:PLOT 2,1:DRAWTO 2=2,1:COLOR 6
  :PLOT 6,1=2:DRAWTO 2=2,1=2
42 IF 2=15 THEN F0R HFOF6,11:F0R HFOF
  1,11:GOTO 26
44 IF 2=11 AND X1=67 THEN 21=21=2:F0R
  HFOF6,X1:F0R HFOF1,11: SOUND 1,6,1,8:G
  OTO 26
46 IF 2=7 AND X1=177 THEN 21=21=2:F0R
  HFOF6,X1:F0R HFOF1,11: SOUND 1,6,1,8:G
  OTO 26
56 IF HKEY(325555)=0 THEN APP=APP+1:GOTO
  APP

```

```

  6,60:DRAWTO 159,66
  799 PLOT 26,56:DRAWTO 25,69:PLOT 26,66:G
  OTO 15,69:PLOT 146,56:DRAWTO 145,59:PLO
  T 146,56:DRAWTO 135,59
  600 IF APP=26 THEN 26
  618 COLOR 1:PLOT 6,51:DRAWTO 159,51:PLOT
  6,56:DRAWTO 159,56
  628 PLOT 26,56:DRAWTO 25,59:PLOT 26,56:G
  OTO 15,59:PLOT 146,56:DRAWTO 145,59:PLO
  T 146,56:DRAWTO 135,59
  636 IF APP=65 THEN 26
  646 COLOR 1:PLOT 6,41:DRAWTO 159,41:PLOT
  6,46:DRAWTO 159,46
  656 PLOT 26,46:DRAWTO 25,49:PLOT 26,46:G
  OTO 15,49:PLOT 146,46:DRAWTO 145,49:PLO
  T 146,46:DRAWTO 135,49
  666 IF APP=66 THEN 26
  676 COLOR 1:PLOT 6,31:DRAWTO 159,31:PLOT
  6,36:DRAWTO 159,36
  686 PLOT 26,36:DRAWTO 25,39:PLOT 26,36:G
  OTO 15,39:PLOT 146,36:DRAWTO 145,39:PLO
  T 146,36:DRAWTO 135,39
  696 IF APP=75 THEN 26
  700 GOTO 26
  777 REM PLAYER MISSILE GRAPHIC SET UP
  1666 GRAPHICS 7:181=125:Y=172:X1=186

```

ROPS ON AN ATARI 400/800 IN T&E

over the orchard wall

BY PETER AND MARK WRIGHT

```

66 IF 1=0 THEN MISS=MISS+1:IF MISS=18 TH
  EN 2666
76 COLOR 1:IF 1=0 THEN SOUND 150
71 SOUND 1,6,6,6:REST 1
74 REM CHECKS FOR NEXT LEVELS
75 IF APP=15 AND L=6 THEN 7 "HOLD ON A M
  INUTE, I'VE FOUND A PLANK":SOUND 6,6,6,6
  :L=1:GOTO 166
86 IF APP=1 THEN 7 "HOLD ON A MINUTE, I'
  VE FOUND ANOTHER":7 "PLANK":SOUND 6,6,6,
  6:GOTO 166
96 GOTO 25
166 F0R 1=1 TO 2666:NEXT 1=0=16:2=2+12
  :Y=264:Y1=Y1-264? "":GOTO 6
149 REM SOUND AND TEST WINDOW INFORMATION
  6
156 F0R 3=1 TO 2: SOUND 6,156,12,14: NEXT
  J:F0R 3=14 TO 6 STEP -1: SOUND 6,156,16,3
  :NEXT J:RETURN
666 F0R M=1 TO 1=2 STEP -1:COLOR 6:PLOT
  7,1:DRAWTO 2=2,2:NEXT M:1=65:F0R 52776,6
  6
665 F0R 3=1 TO 2: SOUND 6,46,19,14: NEXT J
  :F0R 3=14 TO 6 STEP -1: SOUND 6,46,19,14:
  NEXT J
616 F0R 656,617 "MIGHTY GOT 'EMPT' GO F
  AN, GREAT 'IN IT!":GOTO 71
749 REM PLANK AND TRELLIS DRAWING ROUTINE
  65
756 COLOR 1:PLOT 6,71:DRAWTO 159,71:PLOT
  6,76:DRAWTO 159,76
766 PLOT 26,76:DRAWTO 25,79:PLOT 26,76:G
  OTO 15,79:PLOT 146,76:DRAWTO 145,79:PLO
  T 146,76:DRAWTO 135,79
776 IF APP=15 THEN 26
786 COLOR 1:PLOT 6,61:DRAWTO 159,61:PLOT

```

```

  660 GRAPHICS 7=32:COLOR 1:SETCOLOR 2,12
  4:SETCOLOR 4,6,6:SETCOLOR 6,14,4:F0R 7
  52,1=1:GOTO 5
1664 F0R 656,1:F0R 657,11:7 "HOLD ON A
  MINUTE!"
1665 F0R 764,6:F0R 765,6
1616 @=FKEY(1666)=24:F0R 54276,6:FRAMES=
  25:64
1626 F0R 527,62
1636 F0R 5277,3
1646 F0R HFOF6,X1:F0R HFOF1,11
1656 F0R 3=FRAMES+1624 TO FRAMES+1676:FO
  R 3,6: NEXT J
1676 F0R 3=FRAMES+1624+Y TO FRAMES+1632+
  Y:READ A:F0R 3,6: NEXT J
1686 DATA 255,255,255,255,126,126,126,12
  6,66
1696 F0R 1=FRAMES+1266+Y1 TO FRAMES+1276
  +Y1:READ A:F0R 1,6: NEXT 1
1696 DATA 176,121,122,222,66,66,66,66,16
  2,162,222
1716 F0R 627,1
1746 F0R 656
1777 REM PLAYFIELD SET UP
2666 SETCOLOR 1,6,6:COLOR 2:PLOT 129,13:
  DRAWTO 259,6:DRAWTO 6,6
2616 POSITION 6,14:F0R 763,2:STO 18,66,
  6,6,55"
2615 COLOR 2:PLOT 6,14:DRAWTO 17,14
2626 PLOT 6,12:DRAWTO 15,13:PLOT 6,12:G
  OTO 14,12:PLOT 6,11:DRAWTO 11,11:PLOT 1
  1,6: DRAWTO 12,14
2636 COLOR 2:PLOT 7,13:PLOT 16,12
2635 SETCOLOR 3:PLOT 47,14:DRAWTO 78,14:PLO
  T 49,13:DRAWTO 77,13
2646 PLOT 56,12:DRAWTO 76,12:PLOT 53,11

```



```

DRAWTO 74,11:PLOT 50,10:DRAWTO 72,10
2000 PLOT 50,9:DRAWTO 72,9:PLOT 52,9:DRAW
WTO 70,9:PLOT 54,7:DRAWTO 56,7:PLOT 52,8
:DRAWTO 54,8
2000 COLOR 3:PLOT 52,9:PLOT 70,9:PLOT 47
5,9:PLOT 52,10:PLOT 72,11:PLOT 49,10:PLOT
48,10:PLOT 52,12:PLOT 50,12
2000 COLOR 3:PLOT 110,10:DRAWTO 120,10:P
LOT 122,12:DRAWTO 124,12:PLOT 110,12:DRW
WTO 122,12
2000 PLOT 110,11:DRAWTO 122,11:PLOT 117,
10:DRAWTO 121,10
2000 PLOT 140,10:DRAWTO 150,10:PLOT 141,
12:DRAWTO 140,12:PLOT 142,12:DRAWTO 140,
12:PLOT 144,11:DRAWTO 147,11
2000 PLOT 147,10:DRAWTO 150,10
2000 COLOR 3:PLOT 114,10:PLOT 123,10:PLOT
1 114,12:PLOT 120,12:PLOT 119,12:PLOT 12
1,12:PLOT 144,12:PLOT 140,12
2000 PLOT 146,11:PLOT 142,10:IF L=1 THEN
RETURN
2000 COLOR 3:FOR I=15 TO 79:T=INT(PI*10)
+50:PLOT 0,1:DRAWTO 7,1:NEXT I
2000 COLOR 3:PLOT 4,34:PLOT 7,70:PLOT 4,
18:PLOT 4,20
2000 COLOR 3:FOR I=13 TO 80:T=INT(PI*10)
+20+140:PLOT 109,1:DRAWTO T,1:NEXT I
2000 ? "HERE WE ARE OUTSIDE THE ORCHARD
.IF YOURSOP IS APPLES I'M NOT PLAYING."
2000 ? "PRESS RETURN WHEN YOU'RE READY"
:INPUT A$
2000 RETURN
2000 FOR END ROUTINE
2000 FOR 250,0:FOR 257,0:7

```

```

3100 FOR H=1 TO 50:NEXT H:GOTO 0,0,0,0,0
NEXT I
3100 GOTO 0,0,0,0:GOTO 3100
4000 REM OPENING TITLES AND INSTRUCTIONS
2000 GRAPHICS 17:CON 0011:HPSP0=02240:
HPSP1=02240
2000 ? 00:7 00
2000 ? 00:" *****"
2000 ? 00:" a a"
2000 ? 00:" a over the a"
2000 ? 00:" a a"
2000 ? 00:" a orchard wall a"
2000 ? 00:" a a"
2000 ? 00:" *****"
2000 ? 00
2000 ? 00:" BY"? 00
2000 ? 00:"PETER & MARK WRIGHT"
2000 ? 00:" 00"? 00:" 00"? 00
2000 ? 00
2000 ? 00:" do you require"
2000 ? 00:" instructions?"
2000 ? 00
2000 ? 00:" y or n"
2000 SETCOLOR 2,15,0:SETCOLOR 0,11,0
2000 FOR J=1 TO 50:NEXT J
2000 SETCOLOR 0,15,0:SETCOLOR 2,11,0
2000 FOR J=1 TO 50:NEXT J
2000 IF PEEK(764)=43 THEN 2040
2000 IF PEEK(764)=25 THEN FOR 764,255:R
ETURN
2000 GOTO 2170
2040 FOR 764,255:GRAPHICS 0:SETCOLOR 2,
12,0:SETCOLOR 4,14,4
2000 ? "OVER THE ORCHARD WALL,"? "C1
CTR, 0"
2000 ? "Young Albert Atari has managed t
o "? "climb the ivy clad orchard wall,
and"
2000 ? "has disappeared inside."? "I ? "
He will throw the apples over the"
2000 ? "wall. You must try and catch as
many?" "as you can in the basket that A
lbert"
2000 ? "has provided."? "I ? "You can mo
ve left or right by using"? "a joystick
in the left hand socket"
2000 ? " ? " Every time you catch 15 ap
ples,"? "Young Albert will try and make
it"
2000 ? "easier for you?????????"? "I ? "
we hope many apples you can catch"
2000 ? "before Albert gets annoyed at th
e"? "number of apples you miss."
2000 ? "I ? "PRESS RETURN TO START 2040
:INPUT 00
2000 RETURN

```



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(ZX81 16K ONLY)

This real-time graphics adventure set inside the human body was written by a lecturer in anatomy. You are injected into the blood stream in your miniature submarine. Navigate the arteries, veins and heart to the brain, where a blood clot must be dissolved. Features a real circulatory map. You will be attacked by lymphocytes which must be destroyed using evade-game type graphics. Everything you do uses up precious energy. Three display formats — a lateral and frontal body view plus blood vessel maps, a close-up view and a front-right for fighting lymphocytes.

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AWARI

- The ancient African game of logic. It takes 2 minutes to learn the rules but far longer to master the tactics.
- Select the "Great-Grand" level of play and it's an addictive game for children (3+) that exercises their minds — use their feet-fingers.
- Select the "Witch-doctor" level and it's a threat to your sanity. We haven't beaten it and we won't try!

ADVENTURE

- Over 200 places to explore in this machine code game using advanced data compression techniques.
 - No random elements — you will need skill, cunning and a sense of humour as you explore caves, forests and castles.
 - Evade ruthless pirates and overcome a host of obstacles.
 - Multiple word commands and single letter abbreviations.
- Buy both *Awari* and *Adventure* and enter the 'Folklore Challenge' competition. Details with cassette or read SAE.

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FRUIT MACHINE

There's a one-armed monster which works in dark corners and is always ready to take your money. In return it could grant you vast riches — or a pocketful of trash tin.

Yes, this is a game for all of you who like feeding those unwanted bananas — and it won't cost you a penny!

As this is a very long program for the unexperienced M-20 the instructions included are very long — to fit for all of you with extra memory the book job is to type in some extra instructions.

When the latest coin slot shows press "Y" then "Y" to win. "Z" shows your profits and losses. More and more you will present you with the chance to "garbage or collect" which could double or triple your winnings.

Any one or two keys can be "RELOC" by pressing the corresponding number on the keyboard — 1, 2 or 3.

In lines 850-855 certain graphic characters appear. These are specially crafted scenes which will appear as upper case letters when the program is run.

Line 845 graphics are for the word "LOP". Line 847 for "DEBRO" and line 849 for "BROKE EVERY".

The two strange characters in lines 860 and 870 are a reversed "B" and a reversed "Y". These are used to change the character in to lower case and vice versa. They are controlled by the following method.

Type the program from upper to lower case but leave a space where this character is to line on shows but leave a space where you have left, press CTRL and press return.

Pressing the cursor key, position the cursor in the line 860 the key is "B" to line 870 it is "DEBRO B".

Now press the key combined with the program.

Now press return and combine with the program.

The symbol in line 864 is achieved by pressing the "Y" key in special. Line 170 is "Y" in quotes, the typing was done on a dot matrix which does not have the "Y" key, so when you come to a "Y" in quotes just press the "Z" key.

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"Michael Orwin's ZX Cassette Tapes is very good value in content. It could well designed games which work, offer plenty of variety and choice, and are fun."

From the ZX Software review in Your Computer, May '82 issue.

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machine code:

Road Invaders, Phantom plane, Maze of death, Flood levels, Bouncing letters, Bug spin.

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Clint, Madman, Robot, Band Harmon, FIVE Large screen version of Invaders and Maze of Death, ready for when you get 16k. Cassettes 1 costs £3.00

CASSETTE 2

1st game in Basic for 16k ZX81

Cassette Two contains Banana, Asteri, Laser Beam, Word Management, Rattlesnap, Coach, Societal, Porcupine, Furry Maze and Sun Compass.

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CASSETTE 3

8 programs for 16k ZX81

STARSHIP TROJAN

Space your Starship before disaster strikes. Hazards include explosion, radiation, escaped biological specimens and plunging into a supernova.

STARDUST

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PHROGGS OF KHALA

A Zaxxon inspired game for 1 to 4 players.

KAWANOKI Zaxxon's unique card game, full of complex complicated rules.

CUBE Basic Cube computer, with lots of functions including "Backdoor".

SECRET MESSAGES This message coding program is very nice game.

STARSUB CRUISE A simple but addictive game totally unlike any other available in machine code. The speed is variable, and its top speed is very fast. Cassettes 3 costs £5.

CASSETTE 4

8 games for 16k

2D SCRAMBLE (machine code)



Turn and shoot your way through the fortified cars.

SUNBURN

machine code



INVAJERS

machine code



BUNGAJIBS

machine code

SALARY INVADERS machine code

Fields of incoming and diving alien craft.

ORAXIBITE

machine code

Eat the snakes before it eats you. Variable speed very fast at top speed.

WRE (machine code)

A ZX81 version of the well known game.

3D FLYING TIGER (Basic)

Play on a 40k x 64 board, this is a game for the ZX81. It is very hard to beat the computer at it. 2 of the 8 games are in machine code, because this is much faster than Basic. 6 some of these games were previously available from J. Street.

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RUNS ON A DRAGON

IN 32K

BY A. CHAPMAN

MISSILE

THE cities of planet Tamth are peaceful places with some of the most beautiful buildings in any city of the Sol system. But that peace will soon be shattered and the graceful sky towers will soon be burning — unless you can halt the deadly rain of missiles heading toward the planet from the depths of space where a hostile power is lurking . . .

This game for the new Dragon is an adaptation of the video favourite. It's got all the features of the arcade game and should test even the best Missile Commanders.

Line the incoming missiles up in the sights of your anti-missile laser and blast away. Don't let any get through to destroy your planet's cities.

Use keys 1, 2 and 3 to fire and keys U-up, H-left, J-right, N-down to move your laser-sight.

Variables

CS(N): contains information for drawing bases and cities.

H: high score.

A(N),B(N): x,y co-ordinates of missiles.

C(N): whether city destroyed (1) or built (0).

A,B,A1,B1: position of laser-sight.

M(N): number of missiles in base N.

M1(N): x co-ordinates of top of bases.

BS,C: movement.

S: score.

N: number of missiles.

R: radius of explosion.

```
10 REM ***** MISSILE COMMAND *****
20 SCREEN 0:CLS:PRINT "MISSILE COMMAND"
30 SCREEN 0,0:PRINT "A. CHAPMAN"
40 GOTO 100
50 REM *****
60 REM *****
70 REM *****
80 REM *****
90 REM *****
100 DIM A(10),B(10),C(10),D(10),E(10),F(10)
110 DIM G(10),H(10),I(10),J(10),K(10),L(10)
120 DIM M(10),N(10),O(10),P(10),Q(10),R(10)
130 DIM S(10),T(10),U(10),V(10),W(10),X(10)
140 DIM Y(10),Z(10),AA(10),AB(10),AC(10)
150 DIM AD(10),AE(10),AF(10),AG(10),AH(10)
160 DIM AI(10),AJ(10),AK(10),AL(10),AM(10)
170 DIM AN(10),AO(10),AP(10),AQ(10),AR(10)
180 DIM AS(10),AT(10),AU(10),AV(10),AW(10)
190 DIM AX(10),AY(10),AZ(10),BA(10),BB(10)
200 DIM BC(10),BD(10),BE(10),BF(10),BG(10)
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220 DIM BM(10),BN(10),BO(10),BP(10),BQ(10)
230 DIM BR(10),BS(10),BT(10),BU(10),BV(10)
240 DIM BW(10),BX(10),BY(10),BZ(10),CA(10)
250 DIM CB(10),CC(10),CD(10),CE(10),CF(10)
260 DIM CG(10),CH(10),CI(10),CJ(10),CK(10)
270 DIM CL(10),CM(10),CN(10),CO(10),CP(10)
280 DIM CQ(10),CR(10),CS(10),CT(10),CU(10)
290 DIM CV(10),CW(10),CX(10),CY(10),CZ(10)
300 DIM CA(10),CB(10),CC(10),CD(10),CE(10)
310 DIM CF(10),CG(10),CH(10),CI(10),CJ(10)
320 DIM CK(10),CL(10),CM(10),CN(10),CO(10)
330 DIM CP(10),CQ(10),CR(10),CS(10),CT(10)
340 DIM CU(10),CV(10),CW(10),CX(10),CY(10)
350 DIM CZ(10),DA(10),DB(10),DC(10),DD(10)
360 DIM DE(10),DF(10),DG(10),DH(10),DI(10)
370 DIM DJ(10),DK(10),DL(10),DM(10),DN(10)
380 DIM DO(10),DP(10),DQ(10),DR(10),DS(10)
390 DIM DT(10),DU(10),DV(10),DW(10),DX(10)
400 DIM DY(10),DZ(10),EA(10),EB(10),EC(10)
410 DIM ED(10),EE(10),EF(10),EG(10),EH(10)
420 DIM EI(10),EJ(10),EK(10),EL(10),EM(10)
430 DIM EN(10),EO(10),EP(10),EQ(10),ER(10)
440 DIM ES(10),ET(10),EU(10),EV(10),EW(10)
450 DIM EX(10),EY(10),EZ(10),FA(10),FB(10)
460 DIM FC(10),FD(10),FE(10),FF(10),FG(10)
470 DIM FH(10),FI(10),FJ(10),FK(10),FL(10)
480 DIM FM(10),FN(10),FO(10),FP(10),FQ(10)
490 DIM FR(10),FS(10),FT(10),FU(10),FV(10)
500 DIM FW(10),FX(10),FY(10),FZ(10),GA(10)
510 DIM GB(10),GC(10),GD(10),GE(10),GF(10)
520 DIM GH(10),GI(10),GJ(10),GK(10),GL(10)
530 DIM GM(10),GN(10),GO(10),GP(10),GQ(10)
540 DIM GR(10),GS(10),GT(10),GU(10),GV(10)
550 DIM GW(10),GX(10),GY(10),GZ(10),HA(10)
560 DIM HB(10),HC(10),HD(10),HE(10),HF(10)
570 DIM HG(10),HH(10),HI(10),HJ(10),HK(10)
580 DIM HL(10),HM(10),HN(10),HO(10),HP(10)
590 DIM HQ(10),HR(10),HS(10),HT(10),HU(10)
600 DIM HV(10),HW(10),HX(10),HY(10),HZ(10)
610 DIM IA(10),IB(10),IC(10),ID(10),IE(10)
620 DIM IF(10),IG(10),IH(10),II(10),IJ(10)
630 DIM IK(10),IL(10),IM(10),IN(10),IO(10)
640 DIM IP(10),IQ(10),IR(10),IS(10),IT(10)
650 DIM IU(10),IV(10),IW(10),IX(10),IY(10)
660 DIM IZ(10),JA(10),JB(10),JC(10),JD(10)
670 DIM JE(10),JF(10),JG(10),JH(10),JI(10)
680 DIM JJ(10),JK(10),JL(10),JM(10),JN(10)
690 DIM JO(10),JP(10),JQ(10),JR(10),JS(10)
700 DIM JT(10),JU(10),JV(10),JW(10),JX(10)
710 DIM JY(10),JZ(10),KA(10),KB(10),KC(10)
720 DIM KD(10),KE(10),KF(10),KG(10),KH(10)
730 DIM KI(10),KJ(10),KK(10),KL(10),KM(10)
740 DIM KN(10),KO(10),KP(10),KQ(10),KR(10)
750 DIM KS(10),KT(10),KU(10),KV(10),KW(10)
760 DIM KX(10),KY(10),KZ(10),LA(10),LB(10)
770 DIM LC(10),LD(10),LE(10),LF(10),LG(10)
780 DIM LH(10),LI(10),LJ(10),LK(10),LM(10)
790 DIM LN(10),LO(10),LP(10),LQ(10),LR(10)
800 DIM LS(10),LT(10),LU(10),LV(10),LW(10)
810 DIM LX(10),LY(10),LZ(10),MA(10),MB(10)
820 DIM MC(10),MD(10),ME(10),MF(10),MG(10)
830 DIM MH(10),MI(10),MJ(10),MK(10),ML(10)
840 DIM MN(10),MO(10),MP(10),MQ(10),MR(10)
850 DIM MS(10),MT(10),MU(10),MV(10),MW(10)
860 DIM MX(10),MY(10),MZ(10),NA(10),NB(10)
870 DIM NC(10),ND(10),NE(10),NF(10),NG(10)
880 DIM NH(10),NI(10),NJ(10),NK(10),NL(10)
890 DIM NO(10),NP(10),NQ(10),NR(10),NS(10)
900 DIM NT(10),NU(10),NV(10),NW(10),NX(10)
910 DIM NY(10),NZ(10),OA(10),OB(10),OC(10)
920 DIM OD(10),OE(10),OF(10),OG(10),OH(10)
930 DIM OI(10),OJ(10),OK(10),OL(10),OM(10)
940 DIM ON(10),OO(10),OP(10),OQ(10),OR(10)
950 DIM OS(10),OT(10),OU(10),OV(10),OW(10)
960 DIM OX(10),OY(10),OZ(10),PA(10),PB(10)
970 DIM PC(10),PD(10),PE(10),PF(10),PG(10)
980 DIM PH(10),PI(10),PJ(10),PK(10),PL(10)
990 DIM PM(10),PN(10),PO(10),PP(10),PQ(10)
1000 DIM PR(10),PS(10),PT(10),PU(10),PV(10)
1010 DIM PW(10),PX(10),PY(10),PZ(10),QA(10)
1020 DIM QB(10),QC(10),QD(10),QE(10),QF(10)
1030 DIM QG(10),QH(10),QI(10),QJ(10),QK(10)
1040 DIM QL(10),QM(10),QN(10),QO(10),QP(10)
1050 DIM QQ(10),QR(10),QS(10),QT(10),QU(10)
1060 DIM QV(10),QW(10),QX(10),QY(10),QZ(10)
1070 DIM RA(10),RB(10),RC(10),RD(10),RE(10)
1080 DIM RF(10),RG(10),RH(10),RI(10),RJ(10)
1090 DIM RK(10),RL(10),RM(10),RN(10),RO(10)
1100 DIM RP(10),RQ(10),RR(10),RS(10),RT(10)
1110 DIM RU(10),RV(10),RW(10),RX(10),RY(10)
1120 DIM RZ(10),SA(10),SB(10),SC(10),SD(10)
1130 DIM SE(10),SF(10),SG(10),SH(10),SI(10)
1140 DIM SJ(10),SK(10),SL(10),SM(10),SN(10)
1150 DIM SO(10),SP(10),SQ(10),SR(10),SS(10)
1160 DIM ST(10),SU(10),SV(10),SW(10),SX(10)
1170 DIM SY(10),SZ(10),TA(10),TB(10),TC(10)
1180 DIM TD(10),TE(10),TF(10),TG(10),TH(10)
1190 DIM TI(10),TJ(10),TK(10),TL(10),TM(10)
1200 DIM TN(10),TO(10),TP(10),TQ(10),TR(10)
1210 DIM TS(10),TT(10),TU(10),TV(10),TW(10)
1220 DIM TX(10),TY(10),TZ(10),UA(10),UB(10)
1230 DIM UC(10),UD(10),UE(10),UF(10),UG(10)
1240 DIM UH(10),UI(10),UJ(10),UK(10),UL(10)
1250 DIM UM(10),UN(10),UO(10),UP(10),UQ(10)
1260 DIM UR(10),US(10),UT(10),UU(10),UV(10)
1270 DIM UW(10),UX(10),UY(10),UZ(10),VA(10)
1280 DIM VB(10),VC(10),VD(10),VE(10),VF(10)
1290 DIM VG(10),VH(10),VI(10),VJ(10),VK(10)
1300 DIM VL(10),VM(10),VN(10),VO(10),VP(10)
1310 DIM VQ(10),VR(10),VS(10),VT(10),VU(10)
1320 DIM VW(10),VX(10),VY(10),VZ(10),WA(10)
1330 DIM WB(10),WC(10),WD(10),WE(10),WF(10)
1340 DIM WG(10),WH(10),WI(10),WJ(10),WK(10)
1350 DIM WL(10),WM(10),WN(10),WO(10),WP(10)
1360 DIM WQ(10),WR(10),WS(10),WT(10),WU(10)
1370 DIM WV(10),WW(10),WX(10),WY(10),WZ(10)
1380 DIM XA(10),XB(10),XC(10),XD(10),XE(10)
1390 DIM XF(10),XG(10),XH(10),XI(10),XJ(10)
1400 DIM XK(10),XL(10),XM(10),XN(10),XO(10)
1410 DIM XP(10),XQ(10),XR(10),XS(10),XT(10)
1420 DIM XU(10),XV(10),XW(10),XX(10),XY(10)
1430 DIM XZ(10),YA(10),YB(10),YC(10),YD(10)
1440 DIM YE(10),YF(10),YG(10),YH(10),YI(10)
1450 DIM YJ(10),YK(10),YL(10),YM(10),YN(10)
1460 DIM YO(10),YP(10),YQ(10),YR(10),YS(10)
1470 DIM YT(10),YU(10),YV(10),YW(10),YX(10)
1480 DIM YZ(10),ZA(10),ZB(10),ZC(10),ZD(10)
1490 DIM ZE(10),ZF(10),ZG(10),ZH(10),ZI(10)
1500 DIM ZJ(10),ZK(10),ZL(10),ZM(10),ZN(10)
1510 DIM ZO(10),ZP(10),ZQ(10),ZR(10),ZS(10)
1520 DIM ZT(10),ZU(10),ZV(10),ZW(10),ZX(10)
1530 DIM ZY(10),ZZ(10)
```





RHINO

RUNS ON AN ATOM IN 12K BY R. M. ANDREWS

"Out here in the bush we big game hunters have to live by our wits and our trusty elephant guns. Things can get really nasty — and more often than not — they do! Did I ever tell you about the time I was trapped out in the open in Rhine country? That was a tough one I can tell you. Deceit of the brutes came raining at me as I made a

beeline for that old poacher's hut down in the clearing. Luckily I managed to keep dodging through the trees and none of them got me. But, by jove, it was close!"

Now you can relive our hunter's exciting adventure. You are stranded in the bush and your only hope is to reach the sanctuary of a hut situated in a

clearing on the far side of some trees. Once you are in a direct line with a hidden rhino, and providing there are no intervening trees the horned beast will appear and proceed to chase you.

Fortunately for you the rhinos cannot run any faster than you and being big and bulky are unable to follow you diagonally through the

trees. Should you succeed in reaching the hut unassailed the number of rhinos will be increased by one — up to a maximum of 10. You may choose the number of trees you want. The more there are the easier the game.

Full instructions on how to deal with a runaway Rhine are included in the program.

Sinclair ZX Spectrum

**16K or 48K RAM...
full-size moving-
key keyboard...
colour and sound...
high-resolution
graphics...
From only
£125!**



First, there was the world-beating Sinclair 2068. The first personal computer for under £100.

Then, the ZX80. With up to 16K RAM available, and the ZX Printer. Giving more power and more flexibility. Together, they've sold over 500,000 so far, to make Sinclair world leaders in personal computing. And the ZX80 remains the ideal low-cost introduction to computing.

Now there's the ZX Spectrum! With up to 48K of RAM. A full-size moving-key keyboard. Vivid colour and sound. High-resolution graphics. And a low price that's unrivalled.

Professional power—personal computer price!

The ZX Spectrum incorporates all the greatest features of the ZX81. But its new 16K BASIC ROM dramatically increases your computing power.

You have access to a range of 6 colours for foreground, background and border, together with a sound generator and high-resolution graphics.

You have the facility to support separate data files.

You have a choice of storage capacities (governed by the amount of RAM): 16K of RAM (which you can upgrade later to 48K of RAM) or a massive 48K of RAM.

Yet the price of the Spectrum 16K is an amazing £125! Even the popular 48K version costs only £175!

You may decide to begin with the 16K version, if so, you can still return it later for an upgrade. The cost? Around £80.

Ready to use today, easy to expand tomorrow

Your ZX Spectrum comes with a master adaptor and all the necessary leads to connect to most cassette-recorders and TVs (colour or black and white).

Employing Sinclair BASIC (now used in over 500,000 computers worldwide) the ZX Spectrum comes complete with 2 manuals which together represent a detailed course in BASIC programming. Whether you're a beginner or a competent programmer, you'll find them both of immense help. Depending on your computer experience, you'll quickly be moving into the colourful world of ZX Spectrum professional-level computing.

There's no need to stop there. The ZX Printer—available now—is fully compatible with the ZX Spectrum. And later this year there will be Microdrives for massive amounts of extra on-line storage, plus an RS232C network interface board.



Key features of the Sinclair ZX Spectrum

- Full colour—8 colours each for foreground, background and border, plus flashing and brightness intensity control.
- Sound—DEEP command with variable pitch and duration.
- Massive RAM—16K or 48K.
- Full-size moving-key keyboard—all keys at normal typewriter pitch, with repeat facility on each key.
- High-resolution—256 dots horizontally & 192 vertically, each individually addressable for true high-resolution graphics.
- ASCII character set—with upper- and lower-case characters.
- Teletext compatible—user software can generate 40 characters per line or other settings.
- High speed LOAD & SAVE—16K in 100 seconds via cassette, with MERGE & MERGE for programs and separate data files.
- Sinclair 16K extended BASIC—incorporating unique 'one-touch' keyboard entry, syntax check, and report codes.

KRAZY KONG

BY TIMOTHY BOONE

RUNS ON A PET 'N BK

Kong. Now there's a name to conjure with. And that's just what we're doing. At least one of our readers has, and has come up with a version of the famous arcade game. Tim says his game is a very close copy of the arcade game's fourth screen — the most difficult and popular.

If you have not played the arcade version before then you'll need an introduction to one of the best. The basic idea is that Kong has captured the beautiful, innocent and naive girl from the top of the Empire State Building.

Then Jump-Man — so-called because of his amazing jumping prowess — comes to the rescue. Jump-Man has to scale to the top of the building and save the girl from the grasping gorilla.

This game takes part in the attic section of the building. Jump-Man has to knock out the steel supports and wires keeping Kong hanging to his doom. There are eight supports and Jump-Man can knock them out by walking — or jumping — over them.

But there's a catch. These supports are each operated by four moving fireballs — which also burn away the top and bottom ropes of Jump-Man's ladder. If you knock out all the plugs you'll get a frame.

You start out with three lives and can lose them in three ways — as you'll find out, if you manage to complete Kong the program keeps and you get another chance to challenge him.

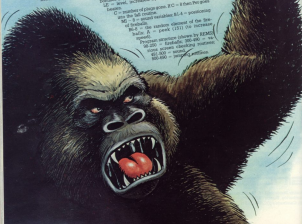
This says his game is a very close copy of the arcade game's fourth screen — the best?

J = position of Jump-Man; SC = score including the bonuses (2);
 LE = level, increased by one every time Kong is beaten;

Q = number of plugs gone; $PC = 1$ then 2 as goes are the full container;
 $MS - 5$ = sound variable; $RL - 1$ = positioning of fireballs;

$ML - 4$ = the random element of the fireballs; K = peak (151) of increase speed;

Program structure (shown by EGMS):
60-200 = fireballs; 200-400 = various screen changing routines;
400-600 = sound;
600-800 = jump, settings.





```

520 D=1+D*POKE1+L GOOUB400 POKE1+M
530 GOOUB400
540 RETURN;SPPING PLIS CHECK***
550 IFFREQ:1=1+L THEN GOOUB1250
560 IFFREQ:1=2+L THEN POKE1+M L D=C+1 SC=SC+100
570 IFFREQ:1=3+L THEN POKE1+M L D=C+1 SC=SC+100
580 IFFREQ:1=4+L THEN POKE1+M L D=C+1 SC=SC+100
590 IFFREQ:1=5+L THEN POKE1+M L D=C+1 SC=SC+100
600 IFFREQ:1=6+L THEN POKE1+M L D=C+1 SC=SC+100
610 IFFREQ:1=7+L THEN POKE1+M L D=C+1 SC=SC+100
620 IFFREQ:1=8+L THEN POKE1+M L D=C+1 SC=SC+100
630 IFFREQ:1=9+L THEN POKE1+M L D=C+1 SC=SC+100
640 IFFREQ:1=10+L THEN POKE1+M L D=C+1 SC=SC+100
650 IFFREQ:1=11+L THEN POKE1+M L D=C+1 SC=SC+100
660 IFFREQ:1=12+L THEN POKE1+M L D=C+1 SC=SC+100
670 IFFREQ:1=13+L THEN POKE1+M L D=C+1 SC=SC+100
680 IFFREQ:1=14+L THEN POKE1+M L D=C+1 SC=SC+100
690 IFFREQ:1=15+L THEN POKE1+M L D=C+1 SC=SC+100
700 RETURN
710 *****
720 *****
730 *****
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770 *****
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M NEXT



MACHINE CODE

ARITHMETIC AND THE EIGHT-BIT . . .

Eight-bit microprocessors have a very limited range of arithmetic instructions, providing only addition and subtraction — and, in the 6809, an eight-bit by eight-bit multiplication.

Unless you are writing mathematical programs you will rarely need more than simple addition and subtraction.

Before we look at the assembly language instructions for addition and subtraction we need to look at the way arithmetic is performed on binary numbers.

An addition with decimal numbers, say $26 + 47$, is carried out digit by digit: $6 + 7 = 13$, which is 3 and carry 1; 2 (the carry) $+ 4 + 7 = 13$, so the answer is 73.

We do binary addition in the same way, so the sum $26 + 47$ in binary is $00110110 + 00101111$, and we calculate the answer as follows:

```
Bit 0: 0+1=1
Bit 1: 1+1=0, carry 1
Bit 2: (carry) 0+1=0, carry 1
Bit 3: (carry) 1+1=1, carry 1
Bit 4: (carry) 1+0=0, carry 1
Bit 5: (carry) 0+0=0, carry 1
Bit 6: (carry) 0+0=0
Bit 7: 0+0=0
```

The bits are numbered in the usual fashion, with bit 0 being the rightmost (least significant) bit and bit 7 being the leftmost bit.

That we find the answer is 01001001, which is, of course, equal to 73 decimal.

An eight-bit binary number can represent a decimal number from 0 to 255, but the sum of two numbers, each less than 256, may be more than 255.

If we take an example, say $180 + 77$, or $10111110 + 00100101$ in binary, and work through the addition we find that the eight-bit answer is 00001111 .

However, in this case we have a carry of 1 from bit 7, and we really need nine bits for the correct answer 00001101 , equal to 857 decimal.

If this addition is performed on an eight-bit microprocessor only eight bits can be retained in the answer but the ninth bit will be stored in the Carry Flag in the flags register, so after the addition $00111110 + 00101111$ the carry flag would be 1, while after the addition $10111110 + 01011110$ the carry flag would be 1.

The carry flag can be used in further processing.

We can now look at the assembly language instructions for performing addition.



FLYING THE FLAG WITH THE 6502

The opcode mnemonic for the address instruction on the 6502 is ADC (Add with Carry), which adds an eight-bit operand to the contents of the accumulator, and the carry flag, leaving the eight-bit result in the accumulator and the carry in the carry flag.

The carry flag is always included in an addition, and we have two instructions to alter the carry flag: CLC (Clear Carry) makes the carry flag 0 and SEC (Set Carry) makes the carry flag 1.

To perform the eight-bit addition from the first example above we could write:

```
LDA #180; Get first number into accumulator
```

```
CLC; Make carry flag zero
ADC #77; Add second number to A, leaving result in A
```

We can use other addressing modes with the ADC instruction, including absolute addressing which we looked at last month, and other addressing modes we have not covered yet.

The registers in the 6502 hold eight bits only and to add numbers larger than 255 (more than eight-bits), we have to break the addition down into eight-bit sections.

For an example of a 16-bit addition, using absolute addressing, suppose we have two 32-bit numbers, the first in memory locations 1000 & 1001 hex, the second in memory locations 1002 & 1003 hex, and we want the answer in memory locations 1004 & 1005 hex (the numbers would be stored with the low eight bits

in the first of the two memory locations).

To get the 16-bit answer we first add the low eight-bits of the two numbers and then add the high eight-bits and the carry from the low eight bits:

```
LDA $1000; Low byte of first number into accumulator
```

```
CLC; Make carry flag 0
ADC $1001; Add low byte of 2nd number
```

```
STA $1004; Store low byte of answer
LDA $1004; High byte of 2nd number into accumulator
```

```
ADC $1005; Add carry and high byte of 2nd number
STA $1006; Store high byte of answer
```

HELPING THE 6809 ADD THINGS UP

For eight-bit addition we have the opcode mnemonics ADDA and ADDCA which use accumulator A, and ADDB and ADCB which use accumulator B. ADDA and ADCB add the eight-bit number specified in the operand to the appropriate accumulator, leaving the answer in the accumulator.

ADDA and ADCB add the operand, accumulator and carry flag, leaving the result in the accumulator. All these instructions leave the carry from the addition in the carry flag.

To perform the addition in the first example above we can write:

```
LDA #180; Get first number into accumulator
```

```
ADCA #77; Add second number, leaving answer in A.
```

As in the 6502 we can use other addressing modes with these addition instructions.

BY TED BALL

We also have the opposite instruction **ADD** for 16-bit addition; the operand on the accumulator **D** which you will remember from last month is really another name for the two eight-bit accumulators **A** and **B** together.

Thus, to add two 16-bit numbers, the first stored in memory locations **1000** and **1001** hex, the second stored in memory locations **1002** and **1003** hex, with the answer being stored in memory locations **1004** and **1005** hex (the numbers being stored with the low byte first), we would write:
LD \$1000; Get first number into D
ADD \$1002; Add 2nd number, leaving answer in D
ST \$1004; Store answer in memory.

There is no add with carry instruction for accumulators **D**.

Addition of numbers with more than 16-bits can be performed by breaking down the numbers into eight or 16-bit sections and adding a section at a time, using an **ADD** instruction for the low eight or 16-bits and an **ADC** instruction for subsequent eight-bit sections.

ADDRESSING YOUR Z80 CORRECTLY

For eight-bit additions we have the opcode instructions **ADD** and **ADC**, each of which can be used in three addressing modes.

The **ADD** instructions add the operand to the accumulator **A**, leaving the result in **A**, and the **ADC** instructions add the carry flag and the operand to the accumulator, leaving the result in the accumulator.

The instructions are **ADD A, data**; **ADD A, data**; **ADD A, reg**; **ADC A, reg**; **ADC A, (HL)**; **ADC A, (HL)**.

In the first pair the operand is included in the instruction; in the second pair the operand is the contents of one of the registers **A**, **C**, **D**, **E**, **H**, **L**; and in the third pair the operand is the contents of the memory location whose address is in the register pair **HL**.

The addition from our first example above can be performed in several ways:

LD A,0; Get first number into accumulator

ADD A,0; Add second number, leaving answer in A.

or
LD A,0; Get first number into A
LD B,17; Get second number into B
ADD A,B; Add B to A leaving answer in A, etc.

We also have the 16-bit addition instructions **ADD HL,BC**; **ADC HL,BC**; **ADD HL,DE**; **ADC HL,DE**; **ADD HL,HL**; **ADC HL,HL**, which add, or add with carry, a register pair to the register pair **HL**, leaving the answer in **HL**.

To add two 16-bit numbers, the first stored in memory locations **1000** hex and **1001** hex, and the second stored in memory locations **1002** hex and **1003** hex, with the answer going into memory locations **1004** and **1005** hex (the numbers being stored with the low byte first), we can write:

LD HL,\$1000; First number into HL
LD BC,\$1002; Second number into BC
ADD HL,BC; Add BC to HL, leaving answer in HL
LD (1004),HL; Store answer in memory.

To add numbers of more than 16 bits we must break up the addition into eight or 16-bit sections and perform the addition one section at a time, using an **ADD** instruction for the low eight or 16-bits and an **ADC** instruction for subsequent eight or 16-bit sections.

PAY YOUR MICRO A COMPLEMENT

So far we have regarded all binary numbers as being positive, eight-bit numbers representing a decimal number from 0 to 255 and 16-bit numbers representing a decimal number from 0 to 65535.

There are several ways of representing negative numbers in binary, but the most common, and the most useful with microprocessors is two's complement notation.

To get the two's complement of a binary number we change the 0s to 1s and the 1s to 0s and add 1 to the result.

For example, to find the two's complement of 1010011 we first change 0s to 1s and 1s to 0s, giving 0101100, then add 1, giving 0101101.

If we add an eight-bit number to its two's complement we always find that the answer is 0000000, with a carry of 1, so the two's complement can be regarded as the negative of the number. Thus we have:

-1 = two's complement of 0000001 = 1111111

-2 = two's complement of 0000010 = 1111110

The easiest way of performing a binary subtraction by hand is to add the two's complement to, for example 1-2 becomes 1 + (-2), or 0000001 + 1111110 which gives an eight-bit answer of 1111111. This is the number we get when we work out the two's complement form of -1.

In two's complement notation an eight-bit binary number represents a number between -128 (decimal) (10000000 binary) and +127 (decimal) (01111111 binary). Note that in the two's complement notation the high order bit of a negative number is 1 and the high order of a positive number is 0.

The subtraction instructions in the eight-bit microprocessors treat binary numbers as having the two's complement form, so, for example 10 - 3 would give the binary result 0000101 and 5 - 13 would give the binary result 1111011.

In the addition of binary numbers we find that when the binary numbers were regarded as representing positive numbers in the range 0 to 255 the result of an addition could be more than 255, in which case the answer was a number less than 255 but the carry flag was set to 1 by the addition.

We have a similar situation with addition and subtraction of two's complement binary numbers.

If the result of the decimal calculation with numbers in the range -128 to +127 comes outside that range the eight-bit answer produced by the processor must of course be treated as a number between -128 and +127, but the **Overflow Flag** (called **V** in the 6502 and 8085, and **C** or **PC** in the Z80) is set to 1.

The assembly language instructions for subtraction are similar to the addition instructions, with **SUB** instead of **ADD** and **SBC** instead of **ADC**, but there are differences between the three processors in the way the carry is handled in the **SBC** instructions.

The 6502 and 8085 have eight and 16-bit **SUB** and **SBC** instructions which can be used in exactly the same way as the **ADD** and **ADC** instructions. The Z80, however, has only **SBC** instructions, and we need to look at this separately.

The **SBC** instruction performs the calculation: **Accumulator** - **operand** - **complement of carry** - **operand** - 1, and if the carry is 1 we get **accumulator** - **operand** - 0.

Thus, to perform a straightforward eight-bit subtraction we must set the carry flag to 1 before performing the subtraction. To subtract 3 from 0 we need to write:

LD A,0; Get 1st number into accumulator
SBC 0; Get carry to 1
SBC 3; Get answer in accumulator.

We can perform 16-bit (or more) subtraction in a similar way to addition. With subtraction instead of addition our previous example becomes:

LD A,\$1000; Low byte of 1st number into accumulator
SBC; Make carry flag 1
SBC \$1002; Subtract low byte of 2nd number.

or
LD A,\$1004; Store low byte of answer
LD A,\$1000; High byte of 1st number into accumulator

SBC \$1002; Subtract high byte of 2nd number and carry

or
STA \$1004; Store high byte of answer.



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Graphics



BETWEEN THE LINES

The effect of hidden line removal is shown in the two accompanying illustrations of rockets. One has hidden lines removed and one does not. I hope you will agree that the drawing of the rocket with the hidden lines removed (Fig 2) appears much more solid and realistic than the other.

The methods used for removing hidden lines are quite complex and highly mathematical, but for certain special cases they can be made comparatively simple.

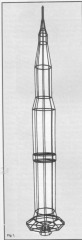


Fig. 1

A technique that helps in producing realistic images of solid objects is the removal of hidden lines from drawings of the object.

When describing a solid object, all the lines that are needed to represent its edges must be given because it may be necessary to view it from any angle.

A view of it from a specific viewpoint can be generated by using the perspective transformation. However, if the transformation is applied indiscriminately to all the lines of the object, what will be seen is a wire-frame approximation of the object with the lines that ought to be obscured from view because they are at the back of the object displayed just as prominently as its lines at the front which obviously are visible.

Although the wire-frame type of image does give a good idea of the shape of the object, it does not always convey the impression of solidity that one might want to achieve. Besides this, it sometimes gives images that are ambiguous in the sense that they make visual sense in more than one way.

These problems can all be overcome if the lines that would be hidden from the viewer are removed.

The first point to make is that what obscures the part of an object that is hidden from view is a surface in front of it. The surface itself is surrounded by edges, all of which will be lines.

So the way to find out which are hidden from view is to determine which surfaces are masked from the observer by others, and then not to draw the lines representing the edges of hidden surfaces.

For this reason, a solid object needs to be described not simply in terms of the lines that give its edges, but also in terms of its surface facets. The lines defining each surface facet must however be given.

To give an example, when dealing with a cube all its six surfaces would need to be given (those at the front, back, left, right, top and bottom). Each would be described by the four lines that surround the square surface facets.

One fairly simple way to remove the hidden lines is to draw each surface as a filled-in area starting from the back (that is, with the

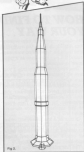


Fig. 2

surfaces furthest from the observer), and working forwards.

In this way plotting the nearer surfaces will automatically cause them to overlap the ones that are further away, thus removing the parts that ought to be obscured.

A second method starts by plotting the points on the object nearest to the observer. It proceeds by examining the points that are further away, but along each line of sight from the observer to the object a region of visibility is maintained by continually updating the upper and lower horizons between which visibility is blocked by the parts already drawn.

Naturally the points that are found to be masked from view are not drawn, thereby removing the hidden parts. Only lines outside the masked region are drawn.

The only place that I have seen a comparatively simple program based on the last method and written in Basic is in *Practical programs for the BBC Computer and Acorn Atom* by David Johnson-Davies (Sigma Technical Press, 1982).

This gives a program for drawing surfaces with hidden line removal. For purposes of comparison, a program for drawing the surface without removing the hidden parts is also given there.

BY GARRY MARSHALL

Adventure

HOW TO FIND YOUR WAY . . .

The deeper you get into writing your Adventure game the more difficult it will become to find your way around the program lines as it continues to expand.

This will be especially true if you have no printer and must catch the lines as they scroll up the screen. Another difficulty is that you may eventually need to renumber the lines to squeeze in a previously unforeseen bit of logic. Then even the line numbers that you remembered will be lost!

Of course, a line printer will make life easier, but is not essential. Having written three Adventures without one, I have developed some guidelines to make life easier.

The first rule is to number lines in increments of no less than 10. This will leave plenty of gaps for insertions, reducing the likelihood of having to renumber.

Line numbers must be placed in advance, and the whole program spattered liberally with remarks. Back in the May issue I summarized how blocks of code might be laid out, and figure 1 shows a suggested range of line numbers for each block.

You can see that the bulk of the program is contained in Block 5 where the routines for each verb reside. Let us look in more detail at this block, as it contains the least distinguishable code in the program.

Start the routine for each verb as an increment of 1000, and then in 50's for each verb. Since each verb

BLOCK	LINE RANGE	PURPOSE
1	100-150	CLEAR string space DEFINE variable type DIMENSION arrays READ DATA
2	200-250	Assign variables Check special conditions Clear screen PRINT display Await INPUT
3	300-450	Interpret INPUT Execute plot (Verb routines)
4	500-600	Set standard replies DATA statements
5	1000-10000	
6	40000 +	
7	80000 +	

Figure 1. Line number range of each coding block

routine will be accessed by an ON EI GOTO statement (EI being the decade number for the verb) it is useful to provide each of these with a REM.

So wait! One of your last tasks on completion of the program will be to remove the REMs for three reasons: to save memory, speed execution, and to remove clues for would-be cheats! If the REMs are written on the lines pointed to by the ON EI GOTO line numbers, undefined line errors will be the order of the day when they're deleted.

So place them as the line immediately preceding the start of each routine. Thus REMs for block 5 would appear on lines 595, 1095, 2095 etc.

When they're gone, the running of the program will not be affected. As a bonus, deleting them will be easier, since they will be recognized as having numbers ending with a 5.

Figure 2 shows some typical code using REMs. Note that they are surrounded by asterisks — much easier to spot when scrolling!

```
595 REM ***** GOTO DECIDED VERB ROUTINES *****
596 ON EI GOTO 1000,2000,3000 ... ETC

599 REM ***** TAKE *****
1000 IF IN >= 6 THEN Q18= "M CARRYING TOO MUCH" : GOTO 100
1010 IF P(22) = 50 THEN Q15 = "ALREADY GOT IT" : GOTO 500
1020 IF P(2) => LN THEN Q15 = "DONT SEE IT HERE" : GOTO 100
1030 IF Q(2) => 3 THEN Q18 = "I CANT GET IT" : GOTO 500
1040 P(21)=50 : IN = IN + 1 : Q15="OK" : GOTO 100
1099 REM ***** DROP *****
2000 IF P(2) => 50 THEN Q18="NOT CARRYING IT" : GOTO 100
etc. etc. . .
```

Figure 2. Typical code showing numbering of REMs

As a change from software, I bring you the fiction on a book — *The Captain of Soul of Basic* adventures. This American publication is by Robert L. Reed, and set me back just under £10.

The opening chapters explain to the newcomer what Adventure is and how to play it. Further chapters advise would-be programmers how to write Adventures (plotting rather than programming the game), and how to market it when written. There is also an "Adventure generator" which I hope to come back to at a later date.

However, the bulk of the book contains the listing of no fewer than 18 Basic Adventures, including the works of well-known authors like Scott Adams, Greg Maxwell and Lance Minkins.

At this point I must make it quite clear that the listings are all in Level II Basic, a fairly standard Microsoft Basic used by TRS-80 Models I and III, and the Video Basic. A forward to the book written by Scott Adams explains most of its peculiarities.

Each listing is preceded by some notes on the program, and all but one look readily convertible to other Basics, being free from POKEs and PEEKs. Anyone with 15k of memory, a good knowledge of their own machine's Basic, and an awareness that the TRS-80 screen has 64 x 20 characters should be able to run most of these listings. All are printed in exceptionally clear plain type rather than a philosophy of printer output, and although this made me apprehensive, I stayed in *Adventure of Fairy by Don and Poodle Power* and the only errors I came across were self-inflicted!

I can recommend it to serious Adventurers — but if you don't have a TRS-80 compatible machine, do browse it before purchasing.

It is published by 88 Northwest Publishing Inc., USA. I bought my copy from Corner of Brighton, but imagine that other dealers could obtain a copy.

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VIDEO SCREEN

DANGEROUS MISSION ON PLANET X

PLANET PATROL

Spectreman's Planet Patrol is an all action warring space game for the Atari VCS.

Imaginative graphics and considerable playability are sure to make this game tough competition for Atari's own Defender.

The idea of the game is to rescue a pilot whose ship is drifting helplessly in space.

But at the same time your planet is being attacked by the TMs (troubledomees invading alien) which you have to shoot down to score points.

When you have shot down the first wave of enemy ships and dodged their missiles you will be able to attack the enemy base. But be careful to dodge the debris from the exploding missile bases as you will need to get past this to land at the space station in order to refuel for the next planet. As you fly on the sky gets gradually darker and finally black.

The game now gets really tough as the screen is only lit by the moon and the occasional explosion of alien craft as your lasers blast deep into the night.

Also new from the Spectreman stable this month is a pretty and computerized grab gambling game called Topwinn.

You guide an ever laughing snake around the screen eating up the pieces of food that float up to its open gape.

It gets ever more difficult to control the snake and you can eat your own tail if you are not careful. Just to make things a little more difficult there are also two villains to be dealt with.

Next is a three space 3D shoot out. Though not quite in the ubiquitous Starwars class it is more the less impressive.

Made in Hong Kong and imported from America there are six games in all in the brand new Spectreman range.

The other titles are Bangale Alley — a sort of shooting arcade where the heads of various villains pop up for you to shoot at, Cross Force — another space



game, and China Syndrome a tough race against time to stop a nuclear reactor exploding, based on the recent movie of the same name.

The games are available in this country in complete PAL form from Funcom of Bromley at £24.95.

LET'S CLUB TOGETHER

GAMES CLUB

If you are fed up of talking out high prices for the latest video game cartridge then this is your chance to win the entire range of Atari compatible games.

The offer comes from the Video Games Club — a new mail order firm which offers a money-back guarantee to club members if they find they can purchase cartridges cheaper elsewhere.

To enter the competition you have to join the club. This costs £25 for life or £2.50 for one year's trial membership.

New members will also receive two free parcels worth over £1.

The first 1,000 members will then have their membership numbers fed into a computer and the lucky winners will be randomly selected.

WELCOME TO THE THIRD GENERATION

COLECOVISION

If you get an Atari VCS or Atari Intellivision games machine for Christmas you may well be kicking yourself, or your dad, when you hear about the exciting new ColecoVision video games system.

The ColecoVision is one of the "third generation" of video games machines.

The video games boom was sparked off by the early ball and ball type games which were often given away free with new TV sets.

The next big breakthrough came with programmable video games such as the Atari VCS on which you could play an infinite number of games by simply purchasing a play-in cartridge at your choice.

The so-called "Third Generation" machines — of which the ColecoVision is the first, are an upgrading and refinement of the second generation machines.

The ColecoVision has a massive 32K of Ram and 32K of Rom mounted under its black exterior. This makes it several times more powerful than all the video games machines currently on sale and also more powerful than most of the popular microcomputers at well.

Converted to gamers language this means superb detail, more moving characters than were previously possible, and greatly enhanced sound and colour.

The new machine will go on sale in the UK in the late Spring and early Summer with an impressive range of well known arcade titles. Prominent among these are Jason, Snake King, Golf and Turbo.

Snake King is practically identical to the Nintendo original and only the three hours play for twenty-pence merchants will be able to notice any difference...

Jason is 90% as good as the arcade game which, for a "state of the art" 3D game is pretty good. Golf too is very close to its arcade counterpart.

The fourth big game from the

arcade to go with the new machine is the driving game Turbo. This requires a play-in dashboard with steering wheel and a foot pedal accelerator which connects to it. The gears are changed with one of the hand controllers which also attaches to the dash.

Taking big names straight from the arcade will be deliberate policy to support the ColecoVision when the machine goes on sale. Through its parent company CBS and Ideal Toys, ColecoVision has first option on buying arcade games from some of the big American and Japanese arcade game designers.

Perhaps the most important of these additions is a converter which enables all existing games for the Atari VCS to be played on the new system.

The next important add on will be a computer keyboard which will turn the ColecoVision into a home computer — a pretty powerful one too as it will access 32K of Ram for user programs.

TOP SELLERS

Market Intimidation and Atari VCS games again dominate our top 10 video games best sellers for the month of November.

Intimidation titles come in first, third, seventh, ninth and 10th places. Dungeons and Dragons holds onto its first place spot in pre-Christmas best seller.

1. Dungeons and Dragons (Mattel); 2. Defender (Atari); 3. B.U. Bomber (Mattel); 4. Pacman (Atari); 5. Empire Strikes Back (Parker Brothers); 6. Star Raiders (Atari); 7. Last 'n' Closest (Mattel); 8. Frogger (Parker Brothers); 9. Night Driver (Mattel); 10. Jet Set (Mattel).



CENTRES TV GAMES CENTRES TV GAMES CENTRES VIDEO SCREEN

SUPERHERO MEETS THE SUPERBADDIE!

SPIDERMAN

Parker Video games will soon be providing some excitement at your local video games shop with personal appearances from Spiderman and Star Wars villain Darth Vader to promote their new games for the Atari VCS.

They will also be launching the Parker Video Games Club with offers of high score T-shirts, posters and cartridge holders, plus the latest information on new releases and when and where the super-heroes will be appearing in person.

There will be plenty to think about on the new games from last month's *Amidar* and *Spiderman* re-releases towards the £34.95 top-tier Atari VCS chart.

Spiderman is challenged to a life or death race. He has to climb a skyscraper and stop the Green Goblin exploding his super-bombs and devastating the city.

Spiderman climbs the building by shooting out his web and then watching himself up. You control the action using the joystick.

Pull the joystick down and Spiderman's web stretches enabling him to swing and kick down Green Goblin's henchmen who appear at the windows. You must be careful not to let the web swing across one of the Goblin's men. They will cut it — sending our hero crashing down to the ground.

The key to success in Spiderman is to use the web accurately and sparingly. You only have a certain amount of web strength which is displayed on the screen and which can also be supplemented by defusing the Goblin's bombs.

Also new from Parker Brothers this month is a version of the arcade game *Amidar*. This is a crazy-race to point in the screen with blue boxes.

You are randomly hit and a point offer and are punished by tags and interference. Quick reactions and a systematic approach are the keys to success in *Amidar*.



Parker Brothers have fifteen new Atari games planned for 1985, with Intellivision and Phillips versions promised for next July.

Next out will be a second Star Wars title called *Jedi Arena* and another game straight from the arcade, *Super Cobra*, the all action helicopter shoot-out, needs no introduction to *Avardians*.

Parker Video games are available from most good Atari stockists at £29.95.

ANYONE LOST AN ARK?

RAIDERS

Ever wished you were Indiana Jones, the swashbuckling hero of *Raiders of the Lost Ark*? Then this is your chance to share some of the action as you join the search for the fabled *Lost Ark of the Covenant*.

In this new game for the Atari VCS you must find the *Ark* which is hidden in the Valley of Pagan, located somewhere outside the Egyptian city of Cairo.

The game follows the adventure format. You move into round the screen searching for clues, collecting treasures, and avoiding such as a whip, a pistol, and flaps, which you will need to overcome specific challenges during the game.

The first scene puts you down in a market place where you have to collect the equipment

you will need for your journey.

The first thing to buy is a flint which protects you from the snakes, spiders, and lava-flies that punish you later in the game.

You will also need a grenade to break your way into one of the rooms where more clues are hidden.

The whip and the pistol enable you to kill some of the adversaries you encounter and also let you blast the walls of the dungeons should you unfortunately find your self incarcerated during the game.

You are only allowed six pieces of equipment at a time. These are all shown at the bottom of the screen and you select the one you want to use by moving the indicator dot to below the appropriate piece.

As with most adventure games you have to explore a number of rooms containing various challenges. In *Raiders* they are based on the film.

Once you have found your way into the enormous maze-like you can begin the search for the *Valley of Pagan* where you will find the *Ark*.

The game is played with both joysticks. The right joystick moves Indy around the screen, cracks his whip, fires his pistol, and explodes his grenades.

The left joystick moves the indicator dot enabling you to select items of equipment.

The game will be in the shops this month retelling at £29.95.

MORE DREAMS FROM THE AMERICANS

INTELLIVISION

Intellivision owners, please if the wider choice of games available for the Atari VCS, will have plenty to smile about in 1985.

The big three independent American games makers have now launched cartridges for the Mattel machine.

Prize-winning Deman Attack which was the top selling video game in America in 1983 is now available for the Intellivision.

Also new from Imagic is an underwater battle game called *Atlantis*, a Donkey Kong-type game called *Beauty and the Beast* and a game of truly breathtaking graphics entitled *Micro-Dungeons*.

This last is based on the science-fiction film *Fantastic Voyage* in which a submarine was reduced millions of times in size and injected into the body of a top scientist.

In *Micro-Dungeons* you are that submarine, seeking fuel and repairing damaged organs.

The talented Activision team have also turned their skills into original games for the Mattel machine. *Pitfall* — the jungle adventure in which our hero swings across invisible steamed springs, seeks treasure, and is chased by scorpions and other nasties can now be enjoyed on your Intellivision.

The second Activision game is *Stampeede*. This transforms you into a cowboy on a horseback, armed with a lasso with which you must round up the stray cattle.

Colco have also joined the race to produce software for Intellivision with versions of their four hottest titles — *Donkey Kong*, *Soft*, *Zaxxon* and *Perils*.

Add to the above all Mattel's own releases and the recent announcement from Parker Brothers that their titles will be available in Mattel format by next July.

It all adds up to much more choice for Intellivision owners in the New Year.

THE SEVENTH

HELPING US TO HELP YOU

The Seventh Empire is a unique game and it is bound to cause some unique problems. We fear that we have done everything we can at our end to combat these problems, but we will need a lot of help from the players.

Time is going to be critical as we must process the orders in time to work out the galactic map for the following issue.

To help with this we will need to be able to easily identify Seventh Empire orders in our post and single them out for processing. Please write "Seventh Empire Orders" on the envelope.

We will need to be able to read your orders clearly, so write them out in rough before filling in the coupon in C&MS, that way your order sheet will not be plagued by crossings out. And try to write clearly and neatly in block capitals, so that we cannot misinterpret your orders.

Always fill in your own code number as this is a double check

A Colour Game home computer is the prize awaiting our top-scoring Seventh Empire commander.

If you can guide your space tribe to the top profile for this opening game turn of Seventh Empire, you will have earned your reward.

And any supreme space commander would be pleased to map out future galactic campaigns on such a fine piece of modern technology.

Lois Electronics is helping the Colour Game take over from its popular predecessor.

In order authentically, you will find your seven fleets starting positions and your code number on the contest sheet with your rule book. If it is missing, or if the sheet contains the wrong name and address, please ring and let us know.

Remember which of your fleets is which. Fleet 1 will be fleet 1 throughout the game and if you have jumbled your fleets the computer will not accept the moves so legal.

The order form will appear each month (see opposite) with a clear scissors mark and cut-line around it.

A LITTLE GENIUS

It offers 16K, 32K and 64K of Basic Rom and a full-size typewriter keyboard. Eight wind colours, high resolution graphics, three channel sound and a 40 x 24 character screen format. It also boasts four programmable function keys and a port for plug-in program cartridges and would cost you £299.50 in the shops.

So whether you want to keep your hand in playing space invaders between stellar playing

for your successful fleets, or would prefer to produce your own program on the likely number of star cruisers to visit Vegas in March, the Colour Game will provide for hours of entertainment.

So all you need to do is work a little magic on your order sheet perhaps rub the old letters and, who knows, a Game may soon materialise on your doorstep ready to do your bidding.

Please cut it out as close to the line as possible and try to avoid excessive folding.

The forms are coded by number and colour and we can only accept orders written out on forms cut from the magazine, not photocopies or in any other piece of paper.

As our end of the game has been designed to eliminate operator error and we are confident that this has been achieved as closely as possible (at certain queries and problems may crop up during play. To sort these out we are having a Seventh Empire problem hour every week.

If you have any problems or queries on the game please ring 01 235 6000 between 1pm and 5pm on Fridays. Then we will have the computer up and running and will be able to answer your queries.

Post is both the asset and the bane of play-by-mail games. An asset because it enables games enthusiasts to find other enthusiasts and play against one

another. A bane because post is not 100% reliable.

A player can miss out a turn and start again next month without being affected. However, late orders are a cause of misery, especially when you check through the following month's issue and find your moves would have earned big profits. (It is like winning the Pools after having forgot to post the coupon.)

A deadline date when your orders are needed back, is printed opposite and it is vital that you should post them back in plenty of time to make up for the vagaries of the post.

There's also the danger that you may get your orders in narrowly too late and so believe your fleets to be elsewhere, while they're actually be lost in space.

Once the computer starts processing it takes many hours for it to come up with the new map and we cannot include late entries. So that deadline date will be final.

YOU CAN STILL ENTER

If you haven't yet entered The Seventh Empire and are tempted by what you can see. Then it's not too late to put your name down to control a space tribe in this massive stellar conflict.

You won't be able to join in this month's competition but we will include your fleets in the following month's game.

Fill in the entry form below and return it to us quickly. The deadline for players wishing to start their Seventh Empire squares in March's issue, is the 15th of January.

To enter The Seventh Empire only costs the price of a stamp each month and enters you into an easy-to-play tactical struggle with up to 16,000 other Computer & Video Games readers.

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Please include me in the Seventh Empire Competition in March. I name my tribe:

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SEVENTH EMPIRE MOVEMENT ORDERS

Key	ORDER	MOVEMENT MODE	CONDITIONS
S	STAY	NONE	None
M	MOVE	TRAVEL	Between stars of same type
T	TRADE	TRAVEL	Between stars of different types and empires at peace
R	RAID	ATTACK	Star of alien empire (phase 1)
R	RETURN	ATTACK	To star of original empire (phase 2)
A	ATTACK	ATTACK	Star of empire at war with original empire
J	JUMP	GATEWAY	To another gateway star
C	CARGO	GATEWAY	To another gateway star
P	PLUNDER	GATEWAY	To another gateway star

The key refers to the computer code for the order but you should write it out in full.

WITH THE EMPIRE

A GALAXY TO CONQUER

Your seven fleets should now be ready to be despatched into the galactic fray. But first the following information will help you plan your campaign through the galaxy, represented by the Galactic Map (right).

The Raid Penalty to be put into your equations for this first turn is 0.

The deadline for orders is **Monday, January 24th**, so don't wait too long before returning them.

Learn to read the Diplomatic Diagram below: a line between two empires means they are at war with one another. So the Star Empire can expect attacks from the Bloodline, Amethyst and Pirate Empires this turn. While the Warstar Empire is only at war with the Dead Empire.

The seven Imperial Ships are not currently shown on this map as no player has had a chance to lay claim to one yet.

Remember: orders can only be entered on the form below (not photo copies).

FENLE ♣	LARLE ♠	VIRET ♠	SOLEP ♠	TELE ♠	FUNUS ♠	LULEP ♠	URNOK ♠	ROEDG ♠	ISOO ♣
VYAK ♣	ORLUS ♠	HAZAN ♠	AMOB ♠	SOMER ♠	VYPOK ♠	QATUT ♠	HEKED ♠	AGOL ♠	MURK ♠
BURON ♠	WEGAN ♠	BURON ♣	WUPEP ♠	PERED ♠	BETEP ♠	WYAYB ♠	WYVES ♠	MEGLD ♠	NABOK ♠
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BRAC ♠	KORPEP ♠	ESODI ♠	PERCO ♠	DEREG ♠	ENAK ♠	KOPAR ♠	LEGAN ♠	POBOV ♠	JENIL ♠
FADIS ♠	LORRE ♠	YUNES ♠	SAPUS ♠	ESUP ♠	FAGEL ♠	LEAG ♠	YOGAR ♠	WIKOD ♠	REED ♠
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ELAR ♠	BERLUP ♠	LEEL ♠	PERAD ♠	JANIL ♠	EDER ♠	WOLAL ♠	URUP ♠	MULED ♠	BUTAK ♠

The Galactic Map

Star type	Trade value
♠	200
♠	150
♣	100
✳	50

Star Types



The Diplomatic Diagram

Orders in Block Caps phase

Name:

Code No: Telephone No:

FLEET	1st Movement phase		2nd Movement phase	
	AT	ACTION	STAR	ACTION
FLEET 1				
FLEET 2				
FLEET 3				
FLEET 4				
FLEET 5				
FLEET 6				
FLEET 7				

I wish to move the Empire's Imperial Ship from to

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REVERSI

OPENINGS: PAIR EXCELLENCE

Chess has a vast store of opening theory which takes white and black into even subtle game positions, built on centuries of study and documentation.

Reversi is also building up a wealth of opening theory which consist of a known sequence of moves at the start of a game and continue until one side has a large choice of good replies to choose from.

These openings usually involve filling in some, or all, of the 16 squares which make up the centre of the Reversi board.

By knowing a bit about openings, you instantly increase your chance of winning, and ensure that no-one will know-beat you into submission early on in the game.

Unlike chess openings, Othello is young enough for openings to change according to whims of great players. So in a computer program you cannot hope to keep abreast of top moves. Better to avoid the worst blunders, then add a strong "reaction" factor to the rest, so that at least sometimes it plays brilliantly!

Black's first move is forced due to symmetry, so we will choose c3 as in the first diagram. White then has three choices which we have named as follows: the "Full" family marked "F" at E5, the "Jerkal" at d5, and the Desert at E5. Top players avoid the Jerkal, though I favour it if White is willing to play outside the

The champions of the Reversi (or Othello) board study their adopted game just as thoroughly as the chess and bridge masters.

And this includes noting down classic games between rival champions and building up an opening theory.

Unlike chess where the book of openings is backed up by several centuries of chess publishing, Othello strategy is still a fairly young science and opening theories are not as stable as those in chess.

All of which makes teaching your computer to use the best openings in its first six to eight moves, very difficult.

So tell the computer to play Desert or Full most of the time.

Let's now see the general algorithms that help you avoid blunders.

The first rule is one of my basic "rules of thumb" of taking as few pieces as possible, but cover the four pieces in the centre as "half" pieces. The second rule is to prefer to complete a "Pair". There are four "Pairs", each being the two adjacent squares to a centre corner, such as the centre sides at d4 and c5 marked "P".

If one square of a Pair is occupied, then the other square is attractive. It often cuts through enemy pieces, which is good play in the middle-game too.

The third rule is to mildly dislike a centre corner if its Pair is empty, to hate a centre corner if its Pair is half-occupied, and to love it if the

Pair is occupied. Balance this with previous rule of thumb of course!

Diagram 1 shows an elegant opening which illustrates the general algorithms well. White plays the Full at E5, to which Black completes the Pair at c5. White avoids the half-empty Centre corner at E5, so has to play d4. Black completes the Pair at c4.

White could then play at the E5 corner, but Black would reply at c5, so instead White plays d6. Black has an equal choice of H5 (d6 being just as good). White takes the cheapest corner, as it is a bit easy to play outside the centre. Black again has two equal moves, to complete a Pair at c6, or E6 a corner at c5. Black chooses c5. White Corner at E5, Black fills Pair at c5, and White completes the shape at c6, as per diagram 2. Black now has only four real choices, as four more are symmetrical, and one gives away a corner. This opening was played by John Parker in the 1981 British Championship to win the final game.

Now look at diagram 3. White played the Desert, Black filled the Pair at H, White had no choice by symmetry, then Black again filled a Pair at c6, White then played at c6 — taking three pieces.

Why? I don't know, but Marooka, a world champion from Japan beat many national champions with it. Where would you reply? c6? e6? g6? g7? Confused? Good, because now you know about as much as Othello openings as anyone.

Figure 1.



Figure 3.



JADE AND THE DRAGON



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P r o j e c t s

MAKING MORE OF YOUR MICRO

Is there life after Kit Korner? The answer from this end is a definite yes. It of course depends on whether or not you are interested in developing new ideas for your computer.

Certainly the technical requirements will not be any more than for the other kits I have already covered. In fact that should be the least of your worries.

You may naturally feel that it is not worth the work involved and decide to buy in a ready built version. In some cases, though, these will not exist, and as I have always said it is far better to build your own as you will learn much faster.

Most of the first few designs I have lined up are based around a single I.C. The reason for this is that they are quite easy to adapt for various micros and are simple to put together.

Later on as I develop new ideas I cannot say what might happen. We will just have to wait and see. As a result of this new expansion there will be far more circuit diagrams and layouts than there have been in the past.

I have always believed that a circuit diagram paints at least a thousand words and is far more informative. Some of the peripheral boards will have some short routines to get you started but the major development will be up to you, as will the use to which you put the board.

Many months ago I took a look at a programmable timer chip, the 6845. I had for a long time wanted to have a go with one just to see what I could manage to do with it. I was pleasantly surprised.

Many of you may already have used interface I.C.s in machine code and fortunately this one is very much like one. It gives you the facility of defining outputs with a certain time lapse or for repeated outputs at set time intervals.

I used the chip first to flash up

lights just to see if it would work. Using all three outputs I could get quite a good random flash and flash length with a little logic and some matrix relays.

The 6845 is a Motorola I.C. designed for the 6800 system, but will work as well with the 6802 or, with a little help, on any eight-bit machine. It needs machine code to run it or an eight-bit output port in basic or an assembler who can use machine code from Basic.

Not everyone will use the same method as I will demonstrate how it works in machine code and then leave it up to you to put the finishing touches to the program. The same goes for the other peripheral boards which I will design for you. You might even like to submit your own versions of the program for scrutiny.

The other I.C. I am interested in developing further is the priority interrupt controller, the 6828. It looks like one of those white



elephants which you don't often see but which you think you could use if you only knew how.

I will be looking into some of the more interesting possibilities of interfacing to which this I.C. can be put. Interactive games controller for one.

One of the problems with this particular I.C. is that it requires a little more software to drive it, so this may be a case for some more instruction than usual.

You may be asking yourself the

question, why am I picking 6800 peripheral I.C. projects rather than the more common versions, say 6802 or 280. Certainly there are just as many I.C.s in their sets as any others.

The main reason is that I have been working for some time on 6800 systems and hopefully know a little of how they work.

Also, 6800 and 6802 peripherals are almost interchangeable. Although 280s are very common these days for micros they are very flexible in their acceptance of other system I.C.s. This makes the use of 6800 peripherals almost ideal for the job.

If you find any others which you think could prove interesting please do not hesitate to let me know. My articles often spring from other people's ideas.

Another idea I have been working on has been the development of a dedicated microprocessor system which would be capable of fulfilling many purposes but would take very little to build.

If you imagine a basic machine and then write down its components you will only come out with a handful. Processor, ROM, RAM, I/O, display and logic circuits.

What makes a micro so expensive? Well mostly it is the bits you don't see to the full. By dedicating a micro to a particular use you are not wasting anything. Unfortunately you will not be able to use it for very much else unless you change the ROM in it which luckily is not too difficult.

As well as being relatively cheap the whole micro will go on in one small board a little larger than Euro-card size. Ever heard of miniserialisation?

However much work is involved in the projects I will of course be showing you the best and hopefully the shortest cuts to getting your prototype to work well.

I hope also that you will help by sending me your own hints and ideas so that I can pass them on to other readers. It all helps in the learning process, which is what we are here for.

Keith Mort

larger table and put the numbers into that, but this would have required two bytes per number and, in addition, I would have needed more DATA lines and the necessary programming to set the table up.

I estimate an extra 300 bytes would have been needed to do that, quite apart from the additional time delay. Accessing the string is done using MEM and VAL. You should always look for these savings.

Full marks if you have seen that I could have made the table smaller by putting 3 numbers in one byte (because 3 is the power of 3 is less than 256, the capacity of one byte).

Now back to the pieces. There are several different types:

- 1 The men are represented by the variables H(1) to H(20).
- 2 Soldiers are kept in C1 and the Headquarters piece is held in C2.
- 3 A major part of the Fox is in C7.

4 (D1) to D(26) are the elimination routines and operate like a slingshot. I find operations very difficult to define succinctly, so in these sequences I push the man into the ground!

The T(6)-6(6) graphics are very simple. The video has 16 rows of 16 blocks and each block contains 5 pixels numbered as fol-



12 bytes by using the DIM statement.

Line 390 asks for a scenario number. All my games have their own random number generator which is seeded with this number. This enables players to replay the same map layout, either because they wish to converse under the same conditions or because they discover a particularly interesting set up. The seed, WD, is calculated from the scenario number. When a random number is needed between, say, 1 and 5, R5 is set to 5 and the generator, line 393 is called. The variable, WR, returns the random number and WD is reseeded. Note that W is defined as Double Precision. Once the board has been set up, I use the Basic random number generator to determine the outcome of attacks.

We now call the intelligence routine at 110. Lines 1100 to 1190 prepare the machine code routines by setting up the JMP table (variable W3).

Do you find this table confusing? Some of the routines call subroutines just like GOSUB in Basic. For example, the routine in X(2) calls R(2). Storage, however, tend to move around in memory during program development and therefore the address of X(2) will change.

WARPATH

Lead the cavalry charge or plan the Indian ambush. Part II of Ron Poykin's series which combines advanced programming tips with a listing which builds into a striking wargame. This month, Ron looks at the pieces.

line

```

1 3
4 5
10

```

To this you must add 128, H(1) — the format is made up of 158 and 146, i.e.

```

2
4 4
16 16

```

CH(2)(24) is an East pointing arrow. Many computers do not have this character — I suggest you replace this with the "Greater than" sign (>ASCI 62).

Before you start typing, LOAD the program from last month. Now add the Basic listing below. This contains a graphic loader. Make sure you type lines 650 to 1050 exactly as they appear. You should also type the changes in line 62.

Make sure you save the program before running it; there are several PCRE and you could run it with a wrong instruction. Fortunately, always save the updated listing onto a new

tape. If anything does go wrong you can always fall back on the previous month. Now type RUN and is answer to the question, "ENTER THE SCENARIO NUMBER" and "HOW MANY SOLDIERS?", type any low number — these are unimportant at present.

After all that hard work, I expect you want to see some action, but we can't do much yet. The subroutines at line 950 include those lines necessary to put the pieces on the map, but before we can do this I must explain two more arrays, PTABLE and BOARD. These will be the subject of next month's article. In the meantime, lines 2210 and 2212 have been adjusted so that the men H(1) have been adjusted so that the men will be placed in the BARRIERS. This will probably create as many Generals as Troopers but it will give you an opportunity to see the results of your efforts.

Line 781 dimension all arrays. Make sure you include even the small ones, EG, for example, only use R(20) and R(2), i.e. 4 bytes. You can save about

Although I can calculate this and PCRE I use X(1), I make pointing either a zero or 24 into the Basic line which would ruin the program. Instead I have created a table whose address is fixed and which can never contain 0 or 24. The address of X(2) is pointed into this together with a JMP instruction. This enables X(2) to call the table which it has jumps to R(2).

The problems with zero and 24 occur with the T(6)-6(6) using Microsoft Basic. Zero is used to signify in the interpreter the end of a Basic line and 24 is the quote character signifying the end of a string. Other computers using different interpreters may vary. On the IBM1 the number to avoid is 25.

I have created variables which are array addresses in the IBM system, i.e. B1 — X(1) address for BARRIERS, B4 — X(4) address for SEARCH, B7 — X(7) address for RANGE.

R(2) is the CLEAR routine. It is used in Line 1100 only. Next month we will examine PTABLE and BOARD.

Two more spell-binders from

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By the way, it's not "Bliss".

It's the open book. I mean, you'd never

I thought that with the spine-flutter option it should open up! It doesn't.

It would be more satisfying if the game's in a book. Or like a play. Ffffft!

They're not even in the manual packaging, the toys, the tools, and

all the rest.

But they didn't say "Without an inquisitorial control net just one but

two or three more garbage packs. Then send them, push them,

toward that sleek hole, and oh, it's so very, very GOOD, and so

finally, sensory.

Please, don't panic, but they won't stop, feeding and spawning

and looting, always turning, towards me, against me, or in.

And I'm alone.

No way out, nowhere to hide, no way open, no place... (JACK,

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STAR RAIDERS

Star Raiders was generally acknowledged as being a "state of the art" computer game when it was launched last year.

This paper here simply means that in terms of quality of graphics, playability, and game development the cartridge is the best that present technology has produced.

The game puts you in the cockpit of an alienian Federation star cruiser chasing the enemy Zylon through space.

By pressing a button on the computer keyboard a map of the galaxy is displayed. This shows the position of enemy ships and starbases in relation to your base.

There are three types of ships to be dealt with. Zylon Fighters are designed for high-speed attacks and can be deadly at close range.

Zylon Cruisers have assigned patrol routes within certain sectors and will only attack if provoked. Bombers can only be destroyed at close range. Use extreme caution when attacking a Bomber.

As well as enemy ships you will also have to avoid the masses of meteorites that are spinning through space.

To aid you in your mission you have a number of sophisticated battle and flight control instruments. Computer Attack Control flashes up gun sights on the screen and enables you to lock on your photon torpedoes, but the Galactic Chart is your most useful aid in your pursuit of the Zylon.

This shows you the entire galaxy divided into sectors containing either enemy starbases, friendly starbases, or are completely unoccupied.

The Hyperspace enables you to travel at accelerated speed to different sectors and the long range scan shows you the positions of approaching enemy fighters.

You can work your way up through the ranks of the star fleet while you play. Some of the ranks will award you.

Once this has been achieved the real fun can begin as you work your way up through the ranks from rookie to Star Commander. The goal thing about the game is that it is pretty tough to win the top rank rating.

Star Raiders is available from most good Atari dealers at £29.95. Not cheap — but an excellent addition to your games library over the less, it sits on an Atari 400 and 800 with version also available for the VIC.

● Getting started	9
● Value	7
● Playability	8



BEWARE OF THE DEADLY BALROG

SORCERERS ISLAND

Does wandering on Sorcerers Island truly help you to find the hidden escape route?

Numerous hidden beauties will try to stop you and take your life during your quest for the lost exit. Some are easy to deal with — but the dreaded Balrog will show no mercy.

You start this adventure with 2,000 life points which decrease as you battle with various monsters to collect the treasures you find along the way.

After each move you are a map of the island is available for your perusal — and you can also check out the spaces immediately next to your present position. Unfortunately neither show the exit or the monsters.

Sorcerers Island is one of two adventure games for the ZX81 from Pisan.

The other — which also requires 1KB to run — is Perilous Swamp. This is the easier of the two games; you have to rescue a princess from an evil wizard. There are more monsters and lots of action. I recommend you try Perilous Swamp first — I've just to take Sorcerers Island. If you like adventure games then this cassette is well worth the price of 04.95.

● Getting Started	7
● Value	7
● Playability	7

BUGGIES WILL SIMPLY DRIVE YOU CRAZY!

BAJA BUGGIES

This is one race that's like the VCS game Night Driver. But Sansitar, the new American Atari software company who released this new game have made full use of the superb graphics of the Atari computer.

The scene is set in the Californian desert. Sand-dunes loom at the top of the screen with a golden sunset in the horizon.

The object of the game is to win the race. But as you start level there are 80 buggies in front of you! Your speed increases automatically and when you press the fire button your brakes go on; you have to slow down or you will lose control.

At the bottom of the screen there is a control panel. This shows your speed, your

position in the race. There's a radar scale which shows how far you are from the finish line. The radar also shows where the leaders are.

If your average speed is better than the speed already on the scoreboard you get a chance to put your initials up. If you wish to join the Baja Buggies Club you must take a photo of your initials in the manufacturer. In return they will send you a keyring and membership card.

One of the annoying things with the game is that if you crash your buggy too often or go off the road too often your buggy will break-down and the game is over. Crashes here buggies could be better. The sounds are also pretty poor in comparison with games like Pitfall.

This 80K game for the Atari 800/800 was good fun to play but overall it was rather disappointing. Baja Buggies is available from Savini Electronics of Manchester at £7.95.

- Getting Started 6
- Rules 7
- Playability 7

DINING OUT WITH THE GHOSTS

SPECTRUM PACMEN

A class of Pacman-type games have been dominating the CBMS review office ever the last few weeks. A new maze gobbling game is added to the list of software available for the Spectrum at the rate of about one a week.

We tested a batch of the more obvious straight copies of the arcade original. First on the screen was Spectyman from Kites Software of London.

This game got off to a bad start as it did not tell us which keys to move my little man around the maze. A prime consideration in this game!

Although the maze looked fairly good the Pacman somehow failed to consume. It just didn't feel like controlling a little chap with a personality of his own.

Having just borrowed an Atari 400 with a Pacman cartridge I was used to much better player involvement in the game.

If you got caught by one of the ghosts the game passed for an annoying long period. There is also an absence of shrieking and gobbling sounds and the characteristic gulp, gulp, gulp as you click 200 then 300 and 400 in the arcade original.

Next up was Mazerunner from Adrensoft of Syde. This was the fastest and most playable of the pile but this too left a little to be desired.

The game produced no sound effects, some fruits or flashing lights.

All of the games would have been greatly improved by the use of a joystick. Playing Pacman without a joystick is rather the thoughtless without the illuminations.

Based on Pacman but with a few twists

of its own was Gulpmen from Campbell Systems of Essex. This game offered thorough instructions with a comprehensive list of game options.

You could choose one of fifteen mazes and vary the speed of your little man and the chasers.

Another interesting variation on the basic Pacman theme was a laser gun with a limited amount of energy with which you could shoot the chasers.

On the minus side Gulpmen has pretty basic graphics. The Gulpmen for example moves around the maze without moving his legs. It would have been more convincing had the program simulated some sort of running motion.

Arco Computing of Hull also produce a Pacman-type game called Gobbelman, which I believe is a fairly close copy of the arcade game. I cannot give you my comments on this game however as it steadfastly refused to load on my Spectrum.

I was not even impressed with any of these versions. I don't know if it's the software or the machine but frankly Spectrum Pacman is not a patch on its Atari and 800 model B counterparts.

But if you really want a Pacman for your Spectrum, Gulpmen just over Macman. You might be better advised going for some of the original maze chase games.

- | | | | |
|-------------------|----------|--------|-------|
| | Scarcity | Review | Price |
| ■ Getting started | 5 | 8 | 9 |
| ■ Rules | 5 | 6 | 5 |
| ■ Playability | 4 | 5 | 7 |

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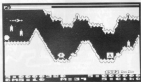
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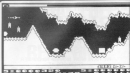
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Fire button

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A fast and furious arcade action game for the ZX Spectrum. Orbiter is written entirely in machine code with full arcade features including scanners, reverse, hyper-space, continuous scoring, sound effects and bonuses.

GROUND ATTACK

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ALIEN DESTROYERS (B) (B) — featured, brain-bused 'STRATEGY' program with an abundance of features. Brilliant use of sound and graphics. 48 using Alien Fleet of three different types plus Meteorite-swinging mystery bonus. Choice of six alien speeds and three levels speeds. Vertical, angled and exploding missiles. Options to restore difficulty and increase new fleet advances. Bonus levels awarded each new level. Scoring according to usual arcade level. Changing display of score and bases, final of game setting of top five scores.

This program has many unique features: 'Battle analysis' (showing the number of each alien type shot down, how many missiles destroyed), the number of shots cleared, the shot rate, the percentage of hits made and the number of bases lost.

CHESS (B) (B) — Our excellent machine code program — now with superb MOSES 1 colour graphics. Six skill levels, play back or advice, illegal moves rejected, no 'passout', casting, take-back of moves, and display of player's cumulative move-time. Options include Six Chess where you must move in 30 seconds, set up all positions for analysis, replay of a game you played and testing of your computer's game-to-type. On reading, a 1970 Chessy Trainer game can be played.

NOTE: Model A Version still available at only £4.95. If you wish to upgrade your Model A version game return your tape, together with £2.50 plus V.A.T. Special Offer does not apply for Model A upgrade.



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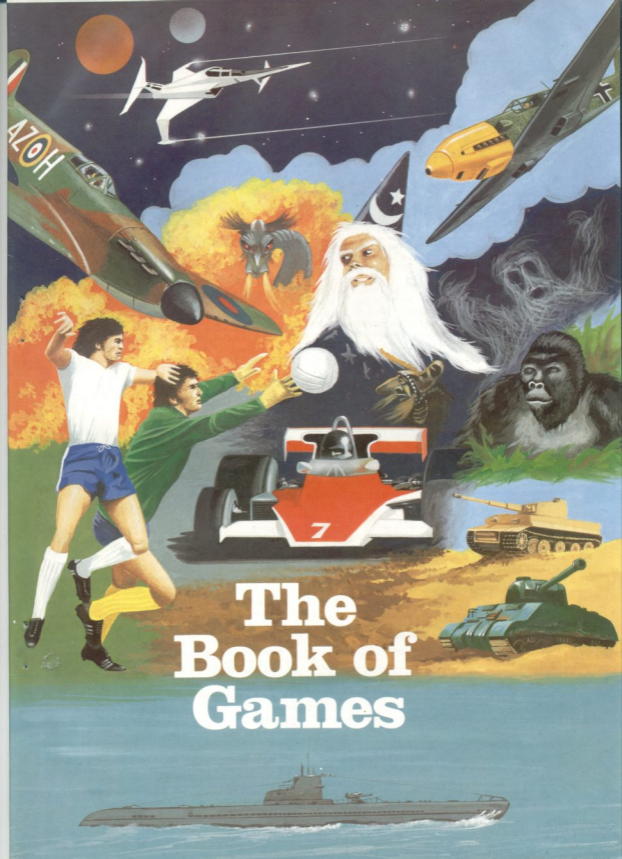
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The Book of Games

The Book of Games

FEBRUARY 1983

Wondering just what to do with the micro you got for Christmas? At a loose end when it comes to game ideas? Never fear — the Book of Games is here!

The Computer and Video Games office is regularly deluged with programs from readers — more than enough to keep the magazine full for the next few centuries. So in order to bring you some of the best games that we've received — but which have not been published within the pages of C&VG — we decided to put them together in this bumper bundle of post-Christmas fun.

All the games have been tried and tested by our busy team of reviewers so any bugs should be few and far between. We also tried to keep the programs short and sweet with the exception of World Cup. We thought it was worth giving more space to. It's a version of the game first published for the Sharp in our June issue — converted for the BBC machine. It proved popular with Sharp owners — so now BBC fans will get a chance to have a crack at the big match.

CONTENTS

DRACULA3	This one will send shivers down your spine. A haunting experience for owners of those sinister black ZX81's.
WORDFIND4	Remember Hangman, that game you used to play on rainy afternoons? Well now it has been transferred to the Atari.
INVADERS5	No dependence of games would be complete without a version of this all time arcade favourite. Blast those little green men on your Spectrum.
MASTER-MIND6	Test your powers of logic and deduction on the TRS-80, model II and III.
REACTION8	How quick are you? Can you beat your Vic-20 to the punch? Program this game in and stand by for action!
PYRAMID OF SECRETS10	Delve in the dark corridors of a long lost tomb in search of a mysterious treasure. Only the bravest TRS-80 owners need apply.

SNAKES12	Are you a slippery customer? Then here's your chance to prove it! Slither up to your Atari and program in this addictive serpentine challenge.
RED ALERT13	Scramble! The aliens are coming and it's your job to stop them. The action takes place in caverns on a distant planet. But you can bring it home on your Vic-20.
MAGIC SQUARE14	Baffled, bothered and bewildered? You will be after trying out this little number on your Atom.
BREAKOUT15	All the colours of the Spectrum are used in this all action arcade style game. If you don't want to become another brick in the wall — knock them down!
AIR ATTACK16	There's an air-sea battle raging in the circuits of an Atari 400. Watch out for those armoured balloons — they are just as dangerous as the high-speed jet fighters . . .
WORLD CUP17	Return to those heady days of summer when the World Cup was still up for grabs. How would you have coped as manager of a top team. The big match awaits on your BBC micro.
BOMBER27	You are the pilot on a do or die mission. Your ancient fighter is running out of fuel. You are flying over a city full of skyscrapers. You need somewhere to land. What happens next? Take to the sky in your BBC powered plane to find out!
ALIEN ATTACK28	Here they come again! You can't keep a good alien down. This time only Sharp owners can save the universe from bug-eyed monsters.
S.O.S MISSION29	Welcome captain, you are in charge of our latest space-battlecruiser on a mission to a planet infested with enemy bases. Can you destroy them before they get you? Sit down at your Pet and find out.
COPY34	Beat your Atom at its own game. Match every move it makes and you'll be a winner. If you fail . . . well, computers can be very nasty sometimes.
GHOSTS34	Watch out for the anti-matter. Beware of the ghosts. Enjoy playing this spirited Spectrum game!
3D MAZE35	Wander around this impressive graphic maze and attempt to get out. Are you Sharp enough to find the exit?
GRAPHICAL GOLF37	This game gets the real game of golf off to a tee. There are all the frustrating hazards of the real game — plus the big thrills. Can you score a hole in one on your ZX81?
DODGEMS39	There's more than a touch of motorway madness about this four-wheeled wonder for the BBC model B.
ALPHA ATTACK41	You are the last survivor on a planet devastated by an alien attack. Can you save your home with your Vic powered laser?
PACMAN42	This arcade funster has inspired pop-records, TV adverts t-shirts — and now this version for the Apple.
VICTORIAN SEWERS45	Ace puzzler Stephen Shaw strikes again with this surprise package for the Texas TI 99/4A.

The Book of Games is a supplement to Computer & Video Games magazine. Editorial and advertisement offices: Durrant House, 8, Herbal Hill, London EC1R 3JB. Telephone Editorial: 01-278 8556. Advertising 01-278 8552. Published and distributed by EMAP National Publications Limited. Typeset by Advantage Filmmaking. Printed by Edean Fisher (Southend) Limited. © Computer & Video Games Limited ISSN 0261 3697.

DRACULA

BY STUART EARL

RUNS ON A ZX81 IN 16K

Listen to the children of the night . . . how sweet they sound. Ahh, there you are my dearrrrs. We must return to our resting place in Castle Dracula.

But look! There's the priest again. He thinks he'll finish us this time. But we'll defeat him yet!

In this charming resurrection of the Dracula story you play the evil count who is returning to his castle after a night out. You must evade the priest and avoid the garlic to reach your castle before sunrise which will spell your doom.

The program includes full instructions and has a high score feature which allows players to enter their names.

```
PRINT "YOU ARE DEAD. SCORE="
1001 IF 100-T>0 THEN PRINT "NAME
1002 TO 10 LETTERS"
1003 IF 100-T>0 THEN INPUT N$
1005 IF LEN N$>6 THEN GOTO 1001
1006 IF PRINT "ANOTHER GO."
1008 IF INKEY$="" THEN GOTO 1000
1009 IF INKEY$<>"Y" THEN GOTO 1000
1010 CLS
1011 GOTO 3
1012 PRINT "WELL DONE YOU HAVE R
1013 REACHED THE CASTLE. SCORE=";T*2
1014 TO 8 LETTERS" THEN PRINT "NAME 1
1015 IF T*2>0 THEN INPUT N$
1017 IF LEN N$>6 THEN GOTO 1000
1018 IF T*2>0 THEN LET Q=T*2
1020 GOTO 1100
1021 PRINT "
1022 DRACULA BY S.
1023 PRINT "
1024 PRINT "S=LEFT 8=RIGHT 5=0
1025 GOTO 7000
1026 PRINT "YOU TAKE THE ROLE O
1027 YOU HAVE GOT 100 SEC
1028 TO YOUR CASTLE YOU B
1029 THE VAMPIRES HAVE B
1030 YOU MUST AVOID THE HO
1031 WHICH IS OUT TO GET
1032 YOU INTO ONE IF YOU ARE SUCCESSFU
1033 STOP IF YOU ARE SUCCESFU
1034 IF YOU ARE NOT YOU ARE
1035 DEAD. IF YOU EALL IN A PIT
1036 IF YOU PRESS 0 YOU
1037 A BAT AND GANT FALL
1038 IN THE TIME BEFORE DAYLIGHT GOE
1039 S TUNCE AS QUICK,PRESSING 1 TU
1040 ANS YOU BACK IF DAYLIGHT BREAKS
1041 GOTO 7000
1042 PRINT "IF YOU GET TO THE D
1043 OUR WATCH OUT FOR THE SWINGING
1044 GARLIC"
1045 PRINT "PRESS N/L"
1046 INPUT N$
1047 GOTO 7000
1048 RUN
1049 SAVE "DRACULA"
1050 GOTO 7000
```

```
AND D+1=F) OR (C=I AND D+1=J) OR
(C=N) THEN GOTO 1000 OR (C=M AND D+1
S20 IF (A=X AND B+1=Y) OR (A=E
AND B+1=F) OR (A=I AND B+1=J) { }
A=K AND B+1=L) OR (A=M AND B+1=N
) THEN LET U=1
530 DEF G=INT (RND*7)+24
540 PRINT AT H,G;"+"
550 IF C=M AND D+1=G+1 AND Z=2
THEN GOTO 1000
560 PRINT AT 0,0;T;AT 0,10;"HIG
M=";0;"N$
565 PRINT AT H,G;"+"
570 IF Z=2 THEN LET T=T-1
580 IF Z=1 THEN LET T=T-2
590 IF U=0 THEN GOTO 1000
600 C=4 AND D=27 THEN GOTO 2
610 GOTO 250
1000 PRINT "YOU ARE DEAD. SCORE="
1001 IF 100-T>0 THEN PRINT "NAME
1002 TO 10 LETTERS"
1003 IF 100-T>0 THEN INPUT N$
1005 IF LEN N$>6 THEN GOTO 1001
1006 IF PRINT "ANOTHER GO."
1008 IF INKEY$="" THEN GOTO 1000
1009 IF INKEY$<>"Y" THEN GOTO 1000
1010 CLS
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1012 PRINT "WELL DONE YOU HAVE R
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1044 GARLIC"
1045 PRINT "PRESS N/L"
1046 INPUT N$
1047 GOTO 7000
1048 RUN
1049 SAVE "DRACULA"
1050 GOTO 7000
```

WORDFIND

```
5 OPEN #1,4,0,"K:"
10 DIM ANSWER$(20), GUESS$(1), ALPHABET$(2
6), USER$(20), CLUE$(15)
20 GOTO 500
30 GRAPHICS 7
35 COLOR 3
40 IF X>=1 THEN PLOT 20,79:DRAWTO 20,20
42 IF X>=2 THEN PLOT 10,79:DRAWTO 20,59:
DRAWTO 30,79
44 IF X>=3 THEN PLOT 20,30:DRAWTO 30,20
46 IF X>=4 THEN PLOT 20,20:DRAWTO 80,20
50 IF X>=5 THEN PLOT 65,20:DRAWTO 65,25:
FOR I=1 TO 35:COLOR 1:READ A,B:PLOT A,B:
NEXT I:RESTORE
60 DATA 63,26,64,26,65,26,66,26,67,26,62
,27,63,27,64,27,65,27,66,27,67,27,68,27,
62,28,63,28,65,28,67,28,68,28
70 DATA 62,29,63,29,64,29,66,29,67,29,68
,29,62,30,63,30,64,30,65,30,66,30,67,30,
68,30,63,31,67,31,64,32,65,32
80 DATA 66,32
90 IF X>=6 THEN COLOR 2:FOR I=61 TO 69:F
OR J=34 TO 44:PLOT I,J:NEXT J:NEXT I
100 IF X>=7 THEN COLOR 1:PLOT 60,34:DRAM
TO 57,39:DRAWTO 57,46:PLOT 60,35:DRAMTO
58,39:DRAMTO 58,46
110 IF X>=8 THEN COLOR 1:PLOT 70,34:DRAM
TO 73,39:DRAMTO 73,46:PLOT 70,35:DRAMTO
72,39:DRAMTO 72,46
120 IF X>=9 THEN COLOR 3:PLOT 61,45:DRAM
TO 69,45:FOR I=61 TO 64:COLOR 2:PLOT I,4
61:DRAMTO I,57:NEXT I
125 IF X>=9 THEN COLOR 3:PLOT 62,58:DRAM
TO 63,58:PLOT 61,59:DRAMTO 64,59
130 IF X=10 THEN COLOR 2:PLOT 65,46:DRAM
TO 65,50:FOR I=66 TO 69:PLOT I,46:DRAMTO
I,57:NEXT I
135 IF X=10 THEN COLOR 3:PLOT 67,58:PLOT
68,58:PLOT 66,59:DRAMTO 69,59
140 IF X<10 THEN 490
145 FOR T=1 TO 750:NEXT T
150 GRAPHICS 1+16:COLOR 1:SETCOLOR 0,0,0
:SETCOLOR 4,0,8:? #6:"THE ANSWER WAS "?:
#6:? #6:? #6:ANSWER$
160 FOR I=1 TO 5:FOR J=1 TO 200:SOUND 0
,J,8,10:NEXT J:SOUND 0,0,0:NEXT I
180 RUN
490 FOR T=1 TO 500+50*X:NEXT T:SOUND 0,0
,0,0:GOTO 600
500 ? "WORDFIND":? "POKE 752,1:" "Do yo
u want instructions (Y or N) ?":GET #1,K
510 IF CHR$(K)="Y" THEN GOSUB 1000
515 ANSWER$=""
520 POKE 752,1:"? INPUT YOUR WORDS":? "
(not more than 20 letters).":? "?"
522 FOR I=1 TO 20:GET #1,K:ANSWER$(I,I)=
CHR$(K):IF CHR$(K)="*" THEN ANSWER$(I,I)
="":GOTO 527
```

BY A. J. DAVIS

RUNS ON AN ATARI 400

IN 16K

The object of Word Find is to guess the hidden word entered into the computer's memory by your opponent. You simply have to type in your choice of letters which will gradually reveal the secret word.

There is a catch however. Just like the pen and paper game Hangman an unfortunate character is gradually progressing toward his doom each time you make a wrong guess.

Will you be able to beat your opponent - and the Hangman - before the poor little chap starts to dangle?

The 'x' character is a clear screen command and it appears in lines 500, 520 and 530. The 'v' in line 1035 should be typed in inverse video.

```
524 NEXT I
525 IF LEN(ANSWER$)>20 THEN 515
527 CLUE$=""
530 ? :? "INPUT YOUR CLUE":? "(not more
than 15 letters)":INPUT CLUE$
535 IF LEN(CLUE$)>15 THEN CLUE$="" :GOTO
527
540 USER$="" :FOR I=1 TO LEN(ANSWER$):USE
R$(I,I)="-":IF ANSWER$(I,I)=CHR$(32) THE
N USER$(I,I)=CHR$(32)
545 IF ASC(ANSWER$(I,I))<65 OR ASC(ANSWE
R$(I,I))>90 THEN USER$(I,I)=ANSWER$(I,I)
550 NEXT I
550 X=0:Y=1
600 GRAPHICS 2:COLOR 1
610 POSITION 0,3:? #6:USER$
620 POSITION 0,9:COLOR 2:? #6:"CLUE":;CL
UE$
630 ? :? "LETTERS USED:-":ALPHABET$:? "I
NPUT YOUR GUESS":GET #1,K:GUESS$=CHR$(K)
:ALPHABET$(Y,Y)=GUESS$:Y=Y+1
635 IF Y>26 THEN Y=26
640 FOR I=1 TO LEN(ANSWER$):IF GUESS$=AN
SWER$(I,I) THEN USER$(I,I)=GUESS$:Z=Z+1:
POSITION I-1,3:? #6:GUESS$:F=1
650 IF F=1 THEN GOTO 665
660 NEXT I:GOTO 670
665 FOR J=1 TO 20:SOUND 0,50,10,14:NEXT
J:SOUND 0,0,0,0:F=0:GOTO 660
670 IF USER$=ANSWER$ THEN GOTO 900
680 IF Z=0 THEN X=X+1:SOUND 0,200,4,12:G
OTO 30
690 Z=0
700 GOTO 630
900 ? "CORRECT"
910 GRAPHICS 2+16:FOR T=1 TO 4:FOR S=1 T
O 15:SETCOLOR 0,5,12/T:POSITION 0,3:? #6
:"CORRECT":SOUND 0,200/5,10,10
915 SETCOLOR 4,16-S,T:POSITION 0,6:? #6:
ANSWER$:SOUND 1,200/T,10,10
920 FOR TIME=1 TO 20:NEXT TIME
930 NEXT S:NEXT T
940 SOUND 0,0,0,0:SOUND 1,0,0,0:RUN
1000 ? :? "The object of WORDFIND is to
guess the":? "hidden word entered by yo
ur opponent"
1010 ? :? "Your opponent must enter the
word(s) of his choice letter by letter
and . press * to end it."
1020 ? :? "You must guess letters in tur
n. To do this simply type the letter of
your"
1025 ? "choice."
1030 ? :? "The computer will do the rest
."
1035 ? :? "PRESS C TO CONTINUE":GET #1,K
:IF CHR$(K)="C" THEN RETURN
1040 GOTO 1035
```

INVADERS

BY ANDREW FILBY

RUNS ON A SPECTRUM IN 16K

These nasty aliens are back again. And they are as dangerous as ever.

You can defend yourself using your laser base. But you can only fire three times at any one alien. The good news is that you can blast their missiles with your laser. The bad news is that those missiles will home in on you.

You may also use the life saving hyperspace button - but only six times. And each time you press the panic button your score decreases.

The lower the alien is before you blast him the more you'll score - but you only have five lives to play with, so don't let them get too close! Use 'm' to move right, 'b' to go left, and 'n' to fire.

```
2 LET UY=0: LET LK=0: LET LO=0:
GO SUB 1000: PAPER 6: LET BS=
CLS: LET HS=0: INK 2: BORDE
R 3
3 DATA 0,0,BIN 00110110,BIN 0
011010,BIN 00011100,BIN 0001110
0,BIN 00011100,BIN 00001000
4 DATA BIN 10001001,BIN 00100
010,0,BIN 0101001,BIN 00001100,B
BIN 10100000,BIN 00001000,BIN 10
10001
5 DATA BIN 00011000,BIN 00011
100,BIN 00111100,BIN 11111111,BI
N 11111111,BIN 11111111,BIN 1100
0011,BIN 10000011
6 DATA BIN 00111001,BIN 00111
11,BIN 00000011,BIN 11110011,BIN
00011111,BIN 00011111,BIN 1111
0110,BIN 00000010,BIN 11000000,B
IN 11000000,BIN 00001000,BIN 000
11111,BIN 11111111,BIN 11111000,
0,0
7 LET SC=0: LET RT=0: LET LI=
4
10 PRINT "SCORE:";SC
LET L=15
LET B=10
11 FOR A=44 TO 148
25 FOR F=AT TO 7: READ A: POKE
USR CHR$(A)+F,A: NEXT F
26 NEXT A
28 PRINT AT 0,15;"*TAB 20 ;"
TAB 25;"*TAB 30;"
29 FOR G=2 TO 20
34 LET I=(RAND*10)+1
35 FOR U=0 TO 20
40 PRINT AT 21,I;"*"
50 PRINT AT I,U;"*"
60 IF SC<1 THEN LET SC=0
65 PRINT AT 0,5;SC
IF INKEY$="N" THEN GO TO 20
81 IF AND(.93 THEN GO TO 78
LET UY=0: LET LO=1
83 FOR C=INT (K+.5) TO 21
84 PRINT AT C,UY;"*"
85 IF SCREEN$(C+1,UY)<>" " TH
EN GO TO 400
86 PRINT AT C,UY;" " IF INKEY
$="N" THEN GO SUB 200
87 IF L<UY THEN LET UY=UY+1
90 IF L>UY THEN LET UY=UY-1
91 IF INKEY$="V" AND RT=5 THE
N GO TO 500
75 NEXT C: LET LO=0
79 PRINT AT I,U;" " ;AT 21,I
80 IF INKEY$="M" THEN LET L=L+
1
80 IF INKEY$="B" THEN LET L=L-
1
100 IF L=0 THEN LET L=33
110 IF L=5 THEN LET L=5
120 NEXT U
130 LET LK=0
135 NEXT G
150 STOP
200 PLDT 0+L+3,3
201 LET LK=LK+1
202 IF LK>3 AND LO=1 THEN RETUR
N
203 IF LK>3 THEN GO TO 51
205 BEEP .05,9
210 DRAW 0,ABS ((.3333333333*k)-
150);PLOT 0+L+3,3
240 DRAW OVER 1,0,ABS ((.33333
3333*k)-175)
255 IF SCREEN$(K,L)<>" " THEN
GO TO 300
256 IF L<UY AND LO=1 THEN RETU
RN
300 GO TO 51
310 PRINT AT K,L;"*"
315 FOR F=1 TO 9: BEEP .02,F: N
EXT F
315 LET SC=SC+INT (100*K)
320 PRINT AT K,L-1;"*"
325 PRINT
330 GO TO 191
400 PRINT AT 0,LI+5+10;" "
410 INK 2
420 PRINT AT 20,L;"*";AT 21,L-1
430 FOR F=-10 TO 10
440 BEEP .05,F
450 BORDER RAND*6+1
450 NEXT F
455 PRINT AT K,U;" "
```

```
465 INK 2
470 LET LI=LI-1
480 IF LI=-1 THEN GO TO 500
490 GO TO 191
500 PRINT AT 10,9: INVERSE 1;"H
YPERSPACE"; INVERSE 0
501 FOR F=10 TO 0 STEP -1
502 PRINT AT 21,I;" " ;AT K,U;"
510 BORDER RAND*6+1: BEEP .02,F
520 NEXT F
530 BEEP 1-10
535 LET L=RND*31
536 LET SC=SC-INT (100/K)*2
537 PRINT AT 10,9;" "
538 LET RT=RT+1
540 GO TO 191
540 PRINT AT 10,0: INVERSE 1;"
YOU SCORED ";SC;"
AND SURVIVED ";G;" ATTACK W
AVES "; INVERSE 0
601 IF SC>HS THEN PRINT "YOU HA
VE BEATEN ";A$;"'S HIGH SCORE OF
";HS: INPUT "Please input name"
A$: LET HS=SC
602 PRINT A$;" has a high score of
";HS
610 PRINT AT 21,0: INVERSE 1;"P
ress 'a' to play again"; INVERSE
0
811 RESTORE
812 PAPER 6: BORDER 1
820 PAPER 1: INK 2: LET HS=SC
820 LET LK=INKEY$
840 IF LK="A" THEN CLS: GO TO
7
850 GO TO 520
1000 PAPER 1: CLS: INK 7
1004 PRINT TAB 4: INVERSE 1;"SPA
CE ATTACK--@--A.FILBY"; INVERSE
0
1010 PRINT "The object of the
game is to shoot down as many sp
ace ships as possible from y
our laser base (L)."
1020 PRINT "At random the alien
s will fire at you, their bombs (
Y) will home in on you, if one is
on target you can go into
HYPERSPACE to be safe, but it wil
l decrease your score. The lo
wer an alien is the more points
it is worth. You have 5 lives a
nd you can move from side to s
ide at 1.5 times as fast
as an alien."
1021 PRINT "You can useHYPERSPAC
E 6 times, but you can only fire
at any alien 3 times. your laser
can stop the bombs"
1040 PRINT "Use 'm' to move rig
ht, 'b' to move left and 'n' to fir
e."
1050 PRINT "'y' puts you into My
perspace"
1060 INPUT "press 'enter' to sta
rt";PS
1100 RETURN
```

MASTERMIND

Can you crack the hidden code? If you can you'll be really worthy of the title of C&W's mastermind!

The program plays the part of the code-maker in the popular game of Mastermind. One of its strongest features is the use of graphics, both in the initial display and in the depiction of the Mastermind board.

The idea behind the game' for those unfamiliar with it, is that a code is set-up, which has to be discovered in as few attempts as possible. The difficulty factor may be altered in two ways.

Firstly the number letters in use may be varied. Secondly the number of positions in the code may be var-

ied. In this game the first option is the one used to provide different levels of play.

On RUNNING the program there is an initial graphic title frame (10-90, 2390-2410). Then there is a brief set of instructions (100-160).

Then the level of play can be entered by the user typing 1.2 or 3.

```

10 REMX GRAPHIC DISPLAY *
20 CLS
30 FORX=1TO180I2=RND(1823):PRINT@Z*,':I:HEXTX
40 FORX=8TO127IY=0ISET(X,Y):Y=47:SET(X,Y):NEXTX
50 FORY=8TO47IX=8ISET(X,Y):IX=127ISET(X,Y):NEXTY
60 FORZ=1TO266I:READX:READYISET(X,Y):NEXTZ
70 PRINT@99*,'MASTER MIND' BY Daniel Bishop, Copyright, 1982.!'
80 FORX=1TO1500I:NEXTX
90 CLS
100 REMX INSTRUCTIONS *
110 PRINT'Master Mind - a game of logic... .!'
120 PRINT'The computer sets up randomly a four letter code. The object of the game is to deduce, by trial and error, the letters and their positions in the fewest possible goes. You may choose to play with 4,8 or 18 letters.'
130 PRINT'Level I : A,B,C,D,E,F' Level
II : A,B,C,D,E,F,G,H Level III : A,B,C,D,E,F,G,H,I,J'
140 PRINT'Your score is shown thus: 'ICHR$(143):'correct letter, correct position.'
150 PRINT' 'ICHR$(137):'correct letter, wrong position.'
160 PRINT'Note! the positions of the scoring pegs bear no relation to the positions of the letters in the code, it varies during the game type R.'
170 REMX SET UP CODE *
180 DEFSTRK,T
190 PRINT:PRINT'Do you wish to play at Level I (1), Level II (2), Level III (3)?'
200 L$=INKEY$:IF L$<>'1' AND L$<>'2' AND L$<>'3' THEN 200
210 IF L$='1' THEN I=4
220 IF L$='2' THEN L=8
230 IF L$='3' THEN L=18
240 FOR Z=1 TO 4
250 R=RND(41):IF R=1THENK(Z)='A'
260 IFR=2THENK(Z)='B'
270 IFR=3THENK(Z)='C'
280 IFR=4THENK(Z)='D'
290 IFR=5THENK(Z)='E'
300 IFR=6THENK(Z)='F'
310 IFR=7THENK(Z)='G'
320 IFR=8THENK(Z)='H'
330 IFR=9THENK(Z)='I'
340 IFR=10THENK(Z)='J'
350 NEXTZ
360 REMX DRAW BOARD *
370 CLS
380 FOR X=4TO39
390 SET(X,1):SET(X,46):SET(X,9):SET(X,18):SET

```

```

(X,16):SET(X,22):SET(X,28):SET(X,34
):SET(X,40)
400 NEXTX
410 FOR X=21 TO39
420 SET(X,2):SET(X,3):SET(X,4)
430 NEXTX
440 FOR Y=1 TO 46
450 SET(4,Y):SET(39,Y)
460 NEXTY
470 FOR Y=1 TO 8I SET(21,Y):NEXTY
480 FOR Y=8 TO 41 STEP 3
490 Y=Y+15:SET(21,Y):Y=Y+11:SET(21,Y):Y=Y+11:SET(21,Y)
500 NEXTY
510 SET(21,45)
520 PRINT@88,'MASTER':PRINT@132,'MIND'
530 FOR X=139TO146I:PRINT@X,CHR$(143):NEXTX
540 PRINT@147,CHR$(175)
550 V=250
560 W=269
570 FOR Y=1 TO 6
580 FOR X=-1 TO 6 STEP 2
590 PRINT@V+X,'0':
600 PRINT@W+X,'0':
610 NEXTX
620 V=V+128:W=W+128
630 NEXTY
640 FOR X=46 TO 69ISET(X,6):NEXTX

```

```

650 FOR X=18TO 123ISET(X,6):NEXTX
660 PRINT@94,'Go!'
670 IFL=6THENL$='Z'
680 IFL=8THENL$='II'
690 IFL=10THENL$='III'
700 PRINT@117,'Level 'L$:
710 G=8
720
730 G=G+1 REMX GO LOOP *
740 PRINT@286,'Please type in your four letters.!'
750 PRINT@97,G:
760 PRINT@94,'
770 FOR Z=1 TO 4
780 T$=INKEY$:IFT$='*'THEN 780
790 IF T$='R' THEN PRINT@94,'Do you wish to restart (Y/N)?'ELSE 820
800 Z$=INKEY$:IF Z$='*ORZ$<>'Y'ANDZ$<>'N'THEN 800
810 IF Z$='Y' THEN 1980 ELSE PRINT@94,'

```

BY DANIEL BISHOP
RUNS ON A TRS80 MODELS I AND III
IN 16K

```

820 IF L=6 THEN 840
830 IF L=8 THEN 850
840 IFT$<>'A'ANDT$<>'B'ANDT$<>'C'ANDT$<>'D'ANDT$<>'E'ANDT$<>'F'ANDT$<>'G'ANDT$<>'H'ANDT$<>'I'ANDT$<>'J'THEN 780 ELSE 870
850 IFT$<>'A'ANDT$<>'B'ANDT$<>'C'ANDT$<>'D'ANDT$<>'E'ANDT$<>'F'ANDT$<>'G'ANDT$<>'H'ANDT$<>'I'ANDT$<>'J'THEN 780 ELSE 870
860 IFT$<>'A'ANDT$<>'B'ANDT$<>'C'ANDT$<>'D'ANDT$<>'E'ANDT$<>'F'THEN 780
870 I(Z)=T$

```



```

800 IF G=1 THEN PRINT@908,T4;
890 IF G=1 AND Z=2 THEN PRINT@910,T5;
900 IF G=1 AND Z=3 THEN PRINT@912,T6;
910 IF G=1 AND Z=4 THEN PRINT@914,T7;
920 IF G=2 AND Z=1 THEN PRINT@908,T5;
930 IF G=2 AND Z=2 THEN PRINT@910,T6;
940 IF G=2 AND Z=3 THEN PRINT@912,T7;
950 IF G=2 AND Z=4 THEN PRINT@914,T8;
960 IF G=3 AND Z=1 THEN PRINT@952,T5;
970 IF G=3 AND Z=2 THEN PRINT@954,T6;
980 IF G=3 AND Z=3 THEN PRINT@956,T7;
990 IF G=3 AND Z=4 THEN PRINT@958,T8;
1000 IF G=4 AND Z=1 THEN PRINT@952,T6;
1010 IF G=4 AND Z=2 THEN PRINT@954,T7;
1020 IF G=4 AND Z=3 THEN PRINT@956,T8;
1030 IF G=4 AND Z=4 THEN PRINT@958,T9;
1040 IF G=5 AND Z=1 THEN PRINT@936,T6;
1050 IF G=5 AND Z=2 THEN PRINT@938,T7;
1060 IF G=5 AND Z=3 THEN PRINT@940,T8;
1070 IF G=5 AND Z=4 THEN PRINT@942,T9;
1080 IF G=6 AND Z=1 THEN PRINT@926,T6;
1090 IF G=6 AND Z=2 THEN PRINT@928,T7;
1100 IF G=6 AND Z=3 THEN PRINT@927,T8;
1110 IF G=6 AND Z=4 THEN PRINT@929,T9;

```

```

1820 IF CC=0 THEN 1870
1830 FOR Z=1 TO 4
1840 PRINT@B(Z),CHR$(143);:CC=CC-1
1850 IF CC=0 THEN 1870
1860 NEXT Z
1870 IF CM=0 THEN 1920
1880 FOR Z=4 TO 1 STEP -1
1890 PRINT@B(Z),CHR$(137);:CM=CM-1
1900 IF CM=0 THEN 1920
1910 NEXT Z
1920 IF W=4 THEN 2030
1930 IF G=6 THEN 2190
1940 GOSUB 1950 : GOTO 1970
1950 W=0:CC=0:CM=0:AT=0:BT=0:ET=0:
FT=0:GT=0:HT=0:IT=0:JT=0:K=0:
W=0:DK=0:EK=0:FK=0:GK=0:HK=0:JK=0
1960 RETURN
1970 GOTO 720
1980 REMK RESIGNED *
1990 PRINT@206, "You have resigned. "
2000 PRINT@914, "
2010 GOTO 2240
2020 REMK WINNING *
2030 PRINT@206, "You have won! Congratulations. "
2040 Z=4:4

```

```

1120 NEXT Z
1130 PRINT@914, "Do you wish to change them (Y/N)?"
1140 Z=INKEY$:IF Z="*" OR Z="Y" AND Z<"N" THEN 1140
1150 IF Z="Y" THEN 760

```

```

2050 IF G=1 THEN PRINT@Z, "That's incredible. The odds of "
2060 IF L=6 THEN D=1296
2070 IF L=8 THEN D=4096
2080 IF L=10 THEN D=10000
2090 IF G=1 THEN PRINT@Z+64, " settings that correct were "
2100 IF G=1 THEN PRINT@Z+127, D;" to one. Go and see an ESP "
2110 IF G=1 THEN PRINT@Z+192, " specialist. "
2120 IF G=2 THEN PRINT@Z, "Wow! That's really amazing. "
2130 IF G=3 THEN PRINT@Z, "You should so professional. "
2140 IF G=4 THEN PRINT@Z, "You're very good. "
2150 IF G=5 THEN PRINT@Z, "You're good. "
2160 IF G=6 THEN PRINT@Z, "Pheui! By the skin of your teeth. "
2170 GOTO 2240
2180 GOTO 2240

```

```

1160 REMK FIND SCORE *
1170 FOR Z=1 TO 4
1180 IF K(Z)="" THEN AK=AK+1
1190 IF K(Z)="" THEN BK=BK+1
1200 IF K(Z)="" THEN CK=CK+1
1210 IF K(Z)="" THEN DK=DK+1
1220 IF K(Z)="" THEN EK=EK+1
1230 IF K(Z)="" THEN FK=FK+1
1240 IF K(Z)="" THEN GK=GK+1
1250 IF K(Z)="" THEN HK=HK+1
1260 IF K(Z)="" THEN IK=IK+1
1270 IF K(Z)="" THEN JK=JK+1
1280 IF T(Z)="" THEN AT=AT+1
1290 IF T(Z)="" THEN BT=BT+1
1300 IF T(Z)="" THEN CT=CT+1
1310 IF T(Z)="" THEN DT=DT+1
1320 IF T(Z)="" THEN ET=ET+1
1330 IF T(Z)="" THEN FT=FT+1
1340 IF T(Z)="" THEN GT=GT+1
1350 IF T(Z)="" THEN HT=HT+1
1360 IF T(Z)="" THEN IT=IT+1
1370 IF T(Z)="" THEN JT=JT+1
1380 NEXT Z
1390 FOR Z=1 TO 4
1400 IF Z(2) <= 0 THEN 1510
1410 IF K(Z)="" THEN AK=AK-1:AT=AT-1:CC=CC+1
1420 IF K(Z)="" THEN BK=BK-1:BT=BT-1:CC=CC+1
1430 IF K(Z)="" THEN CK=CK-1:CT=CT-1:CC=CC+1
1440 IF K(Z)="" THEN DK=DK-1:DT=DT-1:CC=CC+1
1450 IF K(Z)="" THEN EK=EK-1:ET=ET-1:CC=CC+1
1460 IF K(Z)="" THEN FK=FK-1:FT=FT-1:CC=CC+1
1470 IF K(Z)="" THEN GK=GK-1:GT=GT-1:CC=CC+1
1480 IF K(Z)="" THEN HK=HK-1:HT=HT-1:CC=CC+1
1490 IF K(Z)="" THEN IK=IK-1:IT=IT-1:CC=CC+1
1500 IF K(Z)="" THEN JK=JK-1:JT=JT-1:CC=CC+1
1510 NEXT Z

```

```

2200 REMK LOSING *
2210 PRINT@206, "You have lost! Maybe better luck "
2220 PRINT@914, "
2230 REMK GAME OVER *
2240 FOR X=60 TO 77:SET(X,6):NEXT X
2250 PRINT@94, "Game over!"
2260 FOR X=139 TO 146:PRINT@X,CHR$(128):NEXT X
2270 PRINT@147,CHR$(170);
2280 PRINT@148,K(1);PRINT@142,K(2);PRINT@144,K(3);PRINT@146,K(4);
2290 FOR Z=0 TO 99:NEXT Z

```

```

1520 IF K<<ANDAT>> THEN 1530 ELSE 1540
1530 IF K<<ATTHENCK=CK+K:ELSECN=CN+AT
1540 IF K<<ANDBT>> THEN 1550 ELSE 1560
1550 IF K<<BTTHENCK=CK+BK:ELSECN=CN+BT
1560 IF K<<ANDCT>> THEN 1570 ELSE 1580
1570 IF K<<CTTHENCK=CK+CK:ELSECN=CN+CT
1580 IF K<<ANDDT>> THEN 1590 ELSE 1600
1590 IF K<<DTTHENCK=CK+DK:ELSECN=CN+DT
1600 IF K<<ANDET>> THEN 1610 ELSE 1620
1610 IF K<<ETTHENCK=CK+EK:ELSECN=CN+ET
1620 IF K<<ANDFT>> THEN 1630 ELSE 1640
1630 IF K<<FTTHENCK=CK+FK:ELSECN=CN+FT
1640 IF K<<ANDGT>> THEN 1650 ELSE 1660
1650 IF K<<GTTHENCK=CK+GK:ELSECN=CN+GT
1660 IF K<<ANDHT>> THEN 1670 ELSE 1680
1670 IF K<<HTTHENCK=CK+HK:ELSECN=CN+HT
1680 IF K<<ANDIT>> THEN 1690 ELSE 1700
1690 IF K<<ITTHENCK=CK+IK:ELSECN=CN+IT
1700 IF K<<ANDJT>> THEN 1710 ELSE 1720
1710 IF K<<JTTHENCK=CK+JK:ELSECN=CN+JT
1720 REMK PRESENT SCORE *
1730 IF CC=0 AND CM=0 AND G=6 THEN GOSUB 1950 :GOTO 720
1740 IF CC=0 AND CM=0 AND G=6 THEN 2190
1750 IF G=1 THEN S(1)=899: S(2)=901: S(3)=903: S(4)=905
1760 IF G=2 THEN S(1)=771: S(2)=773: S(3)=775: S(4)=777
1770 IF G=3 THEN S(1)=643: S(2)=645: S(3)=647: S(4)=649
1780 IF G=4 THEN S(1)=515: S(2)=517: S(3)=519: S(4)=521
1790 IF G=5 THEN S(1)=387: S(2)=389: S(3)=391: S(4)=393
1800 IF G=6 THEN S(1)=259: S(2)=261: S(3)=263: S(4)=265
1810 W=CC

```

```

2300 PRINT@926, "Do you wish to play again (Y/N)?"
2310 Z=INKEY$:IF Z="*" OR Z="Y" AND Z<"N" THEN 2310
2320 IF Z="N" THEN CLS:END
2330 G=0:GOSUB 1950 : CLS:GOTO 190

```

REMX DATA FOR GRAPHICS DISPLAY *

```

2348
2350 DATA1;21,5,21,6,20,6,21,6,22,6,23,6,24,6,25,6,26,5,27,4,27,3,28,2,28,1,28,0
28,7,24,7,23,8,22,9,21,18,28,11,19,12,19,13,18,14,18,15,18,16,18,16,19,16,20,15
21,15,22,14,23,14,24,13,25,16,21,17,20,18,19,19,18,20,17,21,17,22,16,23,16,24,21
5,25
2358 DATA15;26,15,27,16,26,17,25,18,24,19,24,28,23,21,23,22,23,23,24,23,25,22,26
21,27,21,28,20,29,28,30,19,31,18,32,18,33,18,29,21,30,21,31,21,32,20,33,26,34,2
0,34,19,34,18,35,20,36,28,37,19,38,18,39,17,40,16,41,16,41,17,42,18,41,19,40,19,
0,39,19
2378 DATA43;17,44,14,45,15,46,14,46,13,47,42,17,41,40,10,45,17,46,17,47,17,48,16
49,16,50,14,51,15,52,15,53,15,54,14,55,13,54,13,53,13,52,13,51,14,50,15,49,15,4
9,17,50,17,51,17,52,17,53,17,54,17,55,16,56,15,57,14,58,13,59,13,59,13,59,14,58,
15,58
2388 DATA16;60,13,61,12,62,12,63,12,64,11,65,11,66,11,67,11,68,11,69,10,65,13,47
13,48,12,49,12,50,12,51,11,52,11,53,23,59,22,60,21,61,21,61,22,61,23,61,24,61,2
5,61,26,60,27,59,28,58,29,53,29,56,29,55,30,54,30,53,30,52,30,51,30,50,31,49,31,
48,31,47
2398 DATA31;62,24,63,23,64,22,65,21,66,21,67,20,68,20,69,20,69,21,69,22,69,23,69
24,68,25,67,26,67,27,66,28,70,23,71,22,72,21,73,20,74,19,75,19,76,19,77,19,77,2
0,77,21,76,22,75,23,75,24,74,25,74,26,75,26,76,26,77,26,78,25,79,25,80,24,81,23,
82,22
2408 DATA82;23,82,24,82,25,83,25,84,24,85,23,86,23,87,22,88,22,89,21,90,21,90,21,1
89,23,88,24,91,21,92,20,93,20,94,20,95,20,96,20,96,21,96,22,97,22,98,21,99,21,1
00,20,101,20,102,19,103,18,104,18,105,18,106,18,107,18,108,18,107,21,103,21,104,
21
2418 DATA185;20,106,19,107,19,108,17,109,16,109,15,110,14,108,19,109,19,110,19,11
1,19,11,10,113,18,114,14,115,18,116,17,117,17,110,17,119,17,120,16,121,16,122,
16,123,16,124,15,125,15,126,15,127,15,84,20

```

REACTION

BY J. STANTON

& J. WILKINSON

RUNS ON AN UNEXPANDED VIC-20

Want to hone your reactions for those games of Defender, Frogger — and of course, Pengo — down at your local arcade? Well here's the game that will test your mind to eye powers to the full.

The rules are simple. All you have to do is wait for a dot to appear on the screen, a noise

from your computer and the screen colour to change. As soon as this happens you must the space bar.

Your reaction time is flashed up, and there is also a high score feature which you set with your first attempt.

Further attempts receive com-

ments from your computer and a suitable jingle. Instructions are included in the program which uses the Vic's sound, visual, and colour facilities to the full and should provide a good test to skill for any arcade fan willing to take a break from blasting multi-coloured aliens!

```

1 V=25:POKE36878,6:PRINTCHR$(14):POKE36879,27
2 GOT05000
3 0=0
4 GOT04000
5 PRINT"□"
6 R=INT(RND(TI)*800)
7 G=INT(RND(TI)*400)+100
8 PRINT"HERE IS T-OMESG...":FORA=1T01300:NEXTA:POKE36879,250
9 FORL=1T0400:IFPEEK(197)=32THENGOTO6000:NEXTL:PRINT"□"
20 POKE7680+G,160
22 POKE36876,200
30 POKE38400+G,0
32 FORA=1T050:NEXTA:POKE36876,0
35 F=TI
40 PRINT"□"
50 IFPEEK(197)=32THENGOTO105
58 GOT050
105 PRINT"REACTION TIME:"
106 X=(TI-F)/60
110 PRINT"TIME: ",X," SEC."
120 IF0=1ANDX<=VTHENGOSUB1000
125 IF0=1ANDX>VTHENGOSUB2000
126 IFX<VTHENV=X
130 PRINT"REACT-ASTEST TIME:"
135 PRINT"TIME: ",V," SEC."
140 FORI=1T02000:POKE36879,27:NEXTI

```

```

150 X=0:0=1:GOTO5
1000 POKE36876,225
1005 PRINT"X OELL",
1006 FORA=1T0100:NEXTA
1010 POKE36876,210
1015 FORA=1T075:NEXTA
1016 POKE36876,0
1020 POKE36876,210
1022 PRINT"ONE",
1025 FORA=1T0100:NEXTA
1030 POKE36876,215
1033 PRINT"Y",
1035 FORA=1T0100:NEXTA
1040 POKE36876,210
1043 PRINT"LD",

```

REACTION

```

1045 FORA=1T0200:NEXTA
1050 POKE36876,220
1053 PRINT"ON,",
1055 FORA=1T0125:NEXTA
1056 POKE36876,0
1060 POKE36876,222
1063 PRINT"OELL",
1065 FORA=1T0200:NEXTA
1073 PRINT"ONE!"
1120 POKE36876,0
1130 RETURN
2000 POKE36875,128
2005 PRINT"X WARD",
2010 FORA=1T0400:NEXTA
2020 POKE36875,0
2100 POKE36874,128

```

REACTION

```

2105 PRINT"X LUCK",
2110 FORA=1T0400:NEXTA
2111 PRINT"X HUM"
2115 POKE36875,128
2116 FORA=1T0400:NEXTA
2220 POKE36875,0:POKE36874,0:RETURN
4000 POKE36879,249:PRINT"XXXXXXXX-REACTION!"
4010 PRINT"XXXXXXXX"
4020 PRINT"X X A -IRCLE OILL APPEAR"
4030 PRINT"X IN THE SCREEN AND X"
4040 PRINT"X OISE OILL SOUND..."
4050 PRINT"X YOU JUST HIT THE "
4060 PRINT"X WFACE X WARD";
4070 PRINT"X -AST "
4080 PRINT"X X YOU -AN..."
4200 PRINT"XXXXXXXXX I OOD LUCK!"
4500 FORR=1T07000:NEXTR
4600 GOT05
5000 PRINT"XXXXXXXXXXXXXXXXX INSTRUCTIONS?"
5100 PRINT"XXXXXXXXXXXXXXXXXXXXX(Y/N)"
5200 GETA#
5300 IFA#="Y" THEN GOT04
5310 IFA#="N" THEN5
5350 GOT05200
6000 PRINT"XXXXXXXXX YOU CHEATED!!XXXXXXXXXXXXXXXXX TRY AGAIN"
6050 FORA=1T02000:NEXTA:PRINT"X"
6100 GOT05

```

PYRAMID OF SECRETS

BY STEVE HOLLOWAY



RUNS ON A TRS-80 IN 16K

The builders of those ancient pyramids were crafty people. They used every devious means available to them to protect the treasures of the Pharaoh buried deep with the vaults of their awesome creation.

Trap doors, dead ends, false passageways — these ancient architects employed all the tricks of their trade to make sure no-one could rob the tombs lined with gold and glittering jewels.

Will you dare to enter the pyramid of secrets and search for the treasures which are hidden there? Will you manage to escape once you have found the glittering prize? Or will you gradually starve to death — trapped within the stone corridors of this ancient maze . . .

This is a game for one player. You will be presented with a 3D representation of a maze in which you must move around in.

There are six levels to explore in search of the treasure. But beware of trap doors — and walls that may look solid, but which may slide open if you move forward into them. The trap doors will drop you back to a lower level — and the entrance to the pyramid is one of those moving blocks of stone and may be difficult to find again. There is also a time limit on the game — after it has run out you are presumed dead.

Program notes:

10-80: Input routine and timer advance
100-200: Help routine; gives player's direction, level, treasure and indicates if a moveable wall is nearby
500-530: Solid wall message and open wall routine.
1020-1050: Move player forward.
3000-3020: Routine for finding walls present and whether stairs, trapdoor, treasure.

```
5 GOTO 6000
10 GOSUB3030:PRINT@, "WHICH WAY? (F,L,R,H) 1-";:PRINT@4B, "TIME LEFT -";
20 I$=INKEY$:PRINT@25, I$;:T=T+1:IF T=1000 THEN CLS:PRINT@520, "SORRY - BUT YOU RAN
OUT OF TIME AND STARVED TO DEATH.":END
30 IF I$="F" GOTO 500
40 IF I$="L" THEN D=D-1:IF D=1 THEN D=4:GOTO 10ELSE 10
50 IF I$="R" THEN D=D+1:IF D=4 THEN D=1:GOTO 10ELSE 10
60 IF I$="H" THEN GOSUB 100:GOTO 10
70 PRINT@59, 100-INT(T/100);
80 GOTO 20
100 REM HELP ROUTINE
110 CLS:PRINTTAB(10) "YOU ARE ON LEVEL -";:LV:PRINTTAB(10) "THE EXIT IS ON LEVEL 3
";:PRINT "YOU HAVE ";SC;" POUNDS OF TREASURE"
120 PRINTTAB(10) "YOU ARE FACING ";:DND GOTO 130, 140, 150, 160
130 PRINT "NORTH":GOTO 170
140 PRINT "EAST":GOTO 170
150 PRINT "SOUTH":GOTO 170
160 PRINT "WEST":GOTO 170
170 PRINT "THE EXIT IS ON THE EAST SIDE OF THE PYRAMID:"
180 IF A(X,Y,LV)51:PRINT "THERE IS A MOVEABLE WALL NEXT TO YOUR PRESENT POSITION
"
190 PRINT:PRINT:PRINT "PRESS ANY KEY TO CONTINUE PLAY (NOTE TIME IS SLIPPING BY) "
200 PRINT@4B, "TIME LEFT -";:100-INT(T/100);:T=T+5:I$=INKEY$:IF I$="" THEN 200 ELSE
RETURN
500 A=X:B=Y:GOSUB 3000:IFFW=0 THEN 1020
510 IFFW)OANDF=0 THEN PRINT@530, "THIS IS A SOLID WALL !!!";:FOR I=1 TO 1000:NEXT I:PRI
NTE530, " ";:GOTO 20
520 PRINT@530, "THE WALL OPENS -";:FOR I=179 TO 160:STEP -1:PRINT@I, V0$;:FOR J=1 TO 50:N
E
XT J:NEXT I
530 CLS:PRINT@530, "AND CLOSES BEHIND YOU. . .":FOR I=1 TO 1000:NEXT
1020 IF D=1 THEN Y=Y-1:GOTO 10
1030 IF D=2 THEN X=X+1:GOTO 10
1040 IF D=3 THEN Y=Y+1:GOTO 10
1050 X=X-1:GOTO 10
1060 IF D=1 THEN B=B-1:RETURN
1070 IF D=2 THEN A=A+1:RETURN
1080 IF D=3 THEN B=B+1:RETURN
```

```

1090 A=A-1:RETURN
3000 NW=A(A, B, LV)AND2:HW=A(A, B, LV)AND1:EW=A(A, B, LV)AND4:SW=A(A, B, LV)AND8:FW=NW+R
W+EW:LV=WW:BW=SW:ST=A(A, B, LV)AND96:TR=A(A, B, LV)AND16:PI=A(A, B, LV)AND128:IFD=1THE
N3020
3010 FORI=1TOD-1:Z=FW:FW=RW:RW=BW:BW=LW:LW=Z:NEXTI
3020 F=A(X, Y, LV)AND(FW+S12):RETURN
3030 IFA(X, Y, LV)=769THEN5500ELSEA=X:B=Y:GOSUB3000:IFP1)OANDRND(9)=4THENGOSUB5600
:GOTO10
3040 IFST=64THENCLS:LV=LV-1:PRINT@520, "GOING UP STAIRS":GOSUB7050:GOTO1020ELSEIF
ST=32THENCLS:LV=LV+1:PRINT@520, "GOING DOWNSTAIRS":GOSUB7050:GOTO1020
3050 IFR)OTHENS:SC+RND(10)*10:CLS:PRINT@520, "YOU HAVE COLLECTED MORE RARE TREA
SURES.
YOU NOW HAVE":SC: "POUNDS":A(X, Y, LV)=A(X, Y, LV)-16:GOSUB7050:GOTO10
3060 CLS:PRINT@141, V0#: :PRINT@179, V0#: :IFLW)OPRINT@74, XA#: :PRINT@970, XB#:ELSEPRI
NT@129, W3#: :PRINT@897, W4#:
3070 IFRW)OPRINT@116, XB#: :PRINT@1012, XA#:ELSEPRINT@180, W3#: :PRINT@948, W4#:
3080 IFFW)OPRINT@142, W1#: :PRINT@910, W2#: :RETURN
3090 GOSUB1060:GOSUB3000
3100 IFST=32PRINT@540, S1#: :RETURNELSEIFST=64PRINT@540, S2#: :RETURN
3110 IFLW)OPRINT@142, XC#: :PRINT@910, XE#:ELSEPRINT@334, W7#: :PRINT@718, W8#:
3120 IFRW)OPRINT@299, XD#: :PRINT@811, XF#:ELSEPRINT@363, W8#: :PRINT@747, W8#:
3130 IFTR)OPRINT@861, TR#:
3150 PRINT@342, V1#: :PRINT@362, V1#: :IFFW)OTHENPRINT@343, W5#: :PRINT@727, W6#: :RETUR
N
3160 GOSUB1060:GOSUB3000:
3170 IFST=32THENPRINT@540, S1#: :RETURNELSEIFST=64PRINT@540, S2#: :RETURN
3180 IFLW)OPRINT@343, XG#: :PRINT@727, XH#:ELSEPRINT@407, W4#: :PRINT@663, W4#:
3190 IFRW)OPRINT@423, XI#: :PRINT@679, XJ#:ELSEPRINT@423, W4#: :PRINT@679, W4#:
3200 PRINT@410, V3#: :PRINT@422, V3#: :IFTR)OPRINT@733, TR#:
3210 IFFW)OPRINT@411, W9#: :PRINT@667, W9#: :RETURN
3220 GOSUB1060:GOSUB3000:IFST=32PRINT@540, S1#: :RETURNELSEIFST=64PRINT@540, S2#: :R
ETURN
3230 IFLW)OPRINT@411, CHR*(176):CHR*(176):CHR*(26):CHR*(131): :PRINT@667, CHR*(131):CHR*(27):
CHR*(176):ELSEPRINT@475, CHR*(140):CHR*(140): :PRINT@603, CHR*(140):CHR*(140):
3240 IFRW)OPRINT@484, CHR*(131):CHR*(27):CHR*(176): :PRINT@612, CHR*(176):CHR*(26):
CHR*(131):ELSEPRINT@484, CHR*(140):CHR*(140): :PRINT@612, CHR*(140):CHR*(140):
3260 PRINT@477, CHR*(188):CHR*(26):CHR*(26):V#:CHR*(143): :PRINT@483, CHR*(188):CHR
*(24):CHR*(26):V#:CHR*(143):
3270 IFFW)OPRINT@478, STRING*(5, 140): :PRINT@606, STRING*(5, 140): :RETURNELSEPRINT@4
78, CHR*(176):CHR*(26):CHR*(26):CHR*(179):CHR*(32):CHR*(179):CHR*(27):CHR*(176): :PRINT@606
, CHR*(131): :PRINT@610, CHR*(131): :RETURN
4000 RETURN
5500 CLS:PRINT@520, "YOU ARE OUT!":PRINT"TIME LEFT":32-INT(T/1000):
PRINT"TREASURE COLLECTED":SC: "POUNDS":IF SC)200 PRINT"TRULY
EXCELLENT!":ENDELSO PRINT"YOU DID WELL TO ESCAPE." :END
5600 CLS:PRINT "YOU HAVE STEPPED ON A MOVEABLE TRAPDOOR AND ARE":FORI=154T01020
STEP64:PRINT@1, "FALLING": :FORJ=1TOD30:NEXTJ:PRINT@1, " " :NEXTI:LV=LV+1:RETU
RN
6000 CLEAR 900:DEFINTA-Z:DIMA(11, 11, 6):CLS:PRINT@282, "T H E":PRINT@406, "P Y R A
M I D":PRINT@532, "O F S E C R E T S"
6010 PRINT@588, "" :FORI=1TOD:PRINT"/ " :CHR*(27): :NEXTI:PRINT"/ " :CHR*(92): " " :CHR
*(26): :FORI=1TOD:PRINTCHR*(92):CHR*(32):CHR*(26): :NEXTI:PRINT@640, STRING*(64, "-"
)
6020 PRINT@780, "WRITTEN BY STEVE HOLLOWAY, FEB 1982":LV=5:A(6, 5, 1)=23:A(9, 6, 3)
=769
6030 N1=7-LV:N2=12-N1:FORX=N1TON2:FORY=N1TON2:READA:A(X, Y, LV)=A:NEXTY:NEXTX:LV=L
V-1:IFLW)OTHEN6030
6040 W1#=STRING*(37, 131):W2#=STRING*(37, 176):W3#=STRING*(12, 131):W4#=STRING*(12,
176):XA#=CHR*(131)+CHR*(140)+CHR*(176):XB#=CHR*(176)+CHR*(140)+CHR*(131):PRINT"
PRESS 'I' FOR INSTRUCTIONS OR ANY OTHER KEY TO CONTINUE"
6050 I$=INKEY$:IFI$=""THEN6050ELSEPRINT"JUST A MOMENT":IFI$="I"GOSUB8000
6060 V$=CHR*(191)+CHR*(26)+CHR*(24):FORI=1TOD13:V0$=V$:V$=NEXTI:XC$=CHR*(140)+CH
R*(176)+CHR*(26)+XA#+CHR*(26)+XA#:XD$=XB#+CHR*(27)+XB#+CHR*(27)+CHR*(176)+CHR*(1
40)
6070 XE$=CHR*(140)+CHR*(131)+CHR*(27)+XB#+CHR*(27)+XB#:XF$=XA#+CHR*(26)+XA#+CHR*(
26)+CHR*(131)+CHR*(140):FORI=1TOD:V1$=V1$:V$=NEXTI:W7$=STRING*(8, 131):W8$=STRIN
G*(8, 176):W9$=STRING*(19, 131):W6$=STRING*(19, 176)
6080 S1$="STAIRS"+CHR*(26)+STRING*(5, 24)+"DOWN":S2$="STAIRS"+CHR*(26)+STRING*(4,
24)+"UP":TR$="TREASURE"
6090 W9$=STRING*(11, 140):WA$=STRING*(3, 140):V3$=CHR*(188)+CHR*(26)+CHR*(24)+V$+V
$+V$+CHR*(143):XG$=CHR*(140)+CHR*(176)+CHR*(26)+CHR*(131):XH$=CHR*(140)+CHR*(131
)+CHR*(27)+CHR*(176):XI$=CHR*(131)+CHR*(27)+CHR*(176)+CHR*(140)

```

```

6100 X$=CHR$(176)+CHR$(26)+CHR$(131)+CHR$(140)
6110 FORI=1TO11:FORJ=1TO11:READA:A(I,J,6)=A:NEXTJ:NEXTI
6120 PRINTTAB(8)"PRESS (F) TO OPEN ENTRANCE AND START EXPLORING"
6980 D=4:Y=9:V=6:LW=3:SC=0:T=0
6990 I$=INKEY$:IFI$="F"THENCLS:GOTO$20ELSE6990
7000 DATA3,5,1,5,5,5,9,3,9,2,13,2,5,5,9,14,64,10,14,64,10,3,13,2,9,3,8,3,12,2,12
,7,8,10,10,10,2,5,8,3,29,10,6,6,12,14,10,11,14,2,5,12,3,1,9,10,6,1,8,3,1,12,10,10
,2,29,14,10,32,10,2063,10,10,6,5,13,6,5,12,519,12,32
7010 DATA19,133,5,5,2053,13,32,32,3,5,9,515,5,12,3,8,7,12,10,64,9,10,6,5,5,4,5,8
,6,1,5,13,7,5,8,11,2062,64,1,13,11,10,6,517,5,4,5,140,14
7020 DATA3,1,5,133,13,10,6,9,64,32,6,137,2,133,9,3,12,2,141,10,6,32,2062,6,12,3,
5,32,10,64,9,6,5,140,32
7030 DATA7,9,23,5,5,5,1,1,5,5,9,27,6,9,7,5,9,14,10,11,7,8,10,11,6,5,9,2,5,8,2,29
,10,10,2,1,4109,1034,10,27,10,6,5,8,10,10,10,3,12,10,6,12,3,5,12,6,10,10,7,0,
5,9,14,3,9
7040 DATA3,5,8,6,5,12,11,6,5,12,10,10,7,4,5,1,13,6,1,5,5,12,6,5,9,3,12,64,7,4,1,
5,9,3,29,10,2,5,12,3,29,10,64,10,6,5,12,6,5,13,6,5,12,6,12
7050 FORI=1TO1000:NEXTI:CLS:RETURN
8000 CLS:PRINTTAB(10)"P Y R A M I D O F S E C R E T S":PRINT:PRINT"YOU ARE O
UTSIDE THE ENTRANCE OF THE PYRAMID. IN A MOMENT YOU
CAN ENTER AND FIND YOUR WAY AROUND."
8010 PRINT"THERE ARE TEN TREASURES TO FIND AND MINOR HAZARDS TO AVOID
THERE ARE SOME TRAPS IN THE FLOOR WHICH WILL DROP YOU TO THE LEVEL BELOW SOME
TIMES AND THERE ARE WALLS WHICH LOOK SOLID BUT"
8020 PRINT"WHICH WILL ALLOW YOU THROUGH IF YOU MOVE FORWARD INTO THEM. YOU CONT
ROL YOUR WAY THROUGH THE PYRAMID USING -
(F) FOR FOREWARD, (R) TO TURN RIGHT, (L) TO TURN LEFT
(H) WILL TELL YOU THE LEVEL YOU ARE ON AND
8030 PRINT"THE DIRECTION YOU ARE FACING BUT REDUCE YOUR TIME.
YOUR TIME IS LIMITED SO DON'T TAKE TOO LONG PONDERING !":RETURN

```

SSSNAKES

BY STEVEN JERATH

RUNS ON AN ATARI 400 IN 16K

Are you a slippery customer? Then here's your chance to prove it. The aim of this two player game is to trap your opponent in the coils of your snake while at the same time avoiding getting trapped yourself.

You cannot go back on yourself or touch your own line. You must not touch your opponent's line. Also you have to stay away from the stars which dot the screen -- and of course you must stay away from the walls.

```

5 GOSUB 2000
10 GRAPHICS 7+16:V1=0:V2=0:H1=1:H2=-1
11 SETCOLOR 2,7,8
13 FOR AAA=1 TO 20:COLOR 3:PLOT INT(RND(
0)*160),INT(RND(0)*96):NEXT AAA
20 X1=10:Y1=40:X2=140:Y2=40
29 COLOR 3:PLOT 0,0:DRAWTO 159,0:DRAWTO
159,95:DRAWTO 0,95:DRAWTO 0,0
30 A=STICK(0)
31 B=STICK(1)
50 IF A=14 THEN V1=-1:H1=0
51 IF A=13 THEN V1=-1:H1=0
52 IF A=11 THEN V1=0:H1=-1
53 IF A=7 THEN V1=0:H1=1
60 IF B=14 THEN V2=-1:H2=0
61 IF B=13 THEN V2=1:H2=0
62 IF B=11 THEN V2=0:H2=-1
63 IF B=7 THEN V2=0:H2=1
70 X1=X1+H1:Y1=Y1+V1
80 X2=X2+H2:Y2=Y2+V2
81 IF X1=X2 AND Y1=Y2 THEN 300
85 LOCATE X1,Y1,ZZ:IF ZZ<>0 THEN 100
86 LOCATE X2,Y2,ZZ:IF ZZ<>0 THEN 200
90 COLOR 1:PLOT X1,Y1
91 COLOR 2:PLOT X2,Y2
92 POKE 53279,0
95 GOTO 30
100 GRAPHICS 1+16
101 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10

```

```

102 ? #6:" PLAYER 1 LOSES"
103 R2=R2+1:IF R2>9 THEN 500 SCORES"
104 ? #6:? #6:? #6:"
105 ? #6:" player 1-":R1:? #6:"
player 2-":R2
150 FOR S=0 TO 250:SOUND 0,S,10,10:NEXT
S:SOUND 0,0,0,0 hit any key "
190 ? #6:? #6:? #6:"
199 GET #1,K:GOTO 10
200 GRAPHICS 1+16
201 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10
202 ? #6:" PLAYER 2 LOSES"
203 R1=R1+1:IF R1>9 THEN 600 SCORES"
204 ? #6:? #6:? #6:"
205 ? #6:" player 1-":R1:? #6:"
player 2-":R2
250 FOR S=0 TO 250:SOUND 0,S,10,10:NEXT
S:SOUND 0,0,0,0 hit any key "
290 ? #6:? #6:? #6:"
299 GET #1,K:GOTO 10
300 GRAPHICS 1+16
301 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10
302 ? #6:" you both lost!!!!"
303 ? #6:? #6:? #6:" unlucky!!!!"
304 FOR S=0 TO 20:FOR W=0 TO 10:SOUND 0,
S*10,10,4:SOUND 0,0,0,0:NEXT W:NEXT S
310 GOTO 190
500 GRAPHICS 1+16
501 POKE (PEEK(560)+256*PEEK(561))+3,64+

```

```

7:SETCOLOR 2,7,10
502 ? #6:1" PLAYER NO.2 WINS"
503 FOR ZZZ=0 TO 100:FOR W=0 TO 20:NEXT
W:SOUND 0,ZZZ,10,4:NEXT ZZZ
504 SOUND 0,0,0,0
510 GOTO 610
600 GRAPHICS 1+16
601 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10
602 ? #6:1" PLAYER NO.1 WINS"
603 FOR ZZZ=0 TO 100:FOR W=0 TO 20:NEXT
W:SOUND 0,ZZZ,10,4:NEXT ZZZ
604 SOUND 0,0,0,0
610 ? #6:? #6:? #6:? #6:? #6
620 ? #6:" hit any key for "
630 ? #6:" another game"
640 GET #1,K:RUN
1000 FOR W=0 TO 500:NEXT W

```

```

1001 RETURN
2000 OPEN #1,4,0,"K"
2001 GRAPHICS 1+16
2002 POKE (PEEK(560)+256*PEEK(561))+3,64
+7
2003 ? #6:1" snakes"
2004 SETCOLOR 2,0,14
2010 ? #6:? #6:? #6
2020 ? #6:1" IN THIS 2 PLAYER"
2021 ? #6:1" GAME EACH PLAYER"
2022 ? #6:1" TRIES TO AVOID THE"
2023 ? #6:1" OTHERS TRAIL"
2024 ? #6:1" USING THE JOYSTICK"
2025 ? #6:? #6:? #6:"hit any key to begi
n"
2026 GET #1,K
2030 RETURN
9999 GOTO 9999

```

RED ALERT

BY SIMON PARKER

RUNS ON A VIC-20

IN 16K

Got tunnel vision? Then this game is the one for you! Zapping through narrow tunnels is a task some arcade video freaks just love. And here's a program that will save a few of those precious 10p's.

It's based on arcade Scramble — the game that you either love or hate. For those of you who have yet to come across the game — and you must be few and far between here's a rundown on what you have to do. The idea is to pilot a spacecraft over the ever changing landscape of an alien cavern, dotted with fuel dumps. You must avoid the walls of the cavern and the spaceships which advance against you.

You bomb the fuel dumps and shot down the ships — it's as simple as that!

The program is written mainly in basic apart from a small machine code routine in subroutine 5000. This is used to pull the screen from right to left. The game can be controlled using either the keyboard or a joystick.

```

0 REM**RED ALERT**
1 REM**BY SIMON PARKER**
2 REM**27/6/1982
3 P=7904
4 J=5:G=5:CC=,5:DD=,9
5 GOSUB1000:GOSUB5000
6 TI#="000000"
10 PRINT " "
20 POKE36879,143:POKE36878,15
30 B=RND(1)
31 IFTI#="000200"THENPOKE36879,8:CC=,65:DD=,8
32 IFTI#="000330"THENPOKE36879,57:CC=,75:DD=,7
35 C=RND(1)
36 IFB<CCTHENJ=J+1:GOTO40
37 J=J-1
40 IFC<CCTHENG=G+1:GOTO46
45 G=G-1
46 IFJ<10ANDG<10THENG=G-1:J=J-1
47 IFJ<G<17THENJ=J-1:G=G-1
48 IFJ<1THENJ=1
49 IFG<1THENG=1
50 FORK=1TODJ
60 POKE8185-22*K,20
61 NEXTK:IFB<,20RBD,8THENPOKE8185-22*K,22:POKE81
85+30720-22*K,2
62 FORK=1TODG
65 POKE7701+22*K,20
66 NEXTK
70 IFC<DDTHENPOKE7701+22*K+44,24:POKE368421+22*K+44,2
91 POKEP,32
100 SYS(829)
125 POKEP,21:POKEP-1,32
126 PRINT "SCORE"SC
130 POKEP,32
135 L2=PEEK(197):P2=PEEK(653)
140 L=PEEK(37137):POKE37154,127:P1=PEEK(37152):POKE37154,255
143 IFL=30ANDP1=1190RP2=1ANDL2=14THENGOSUB4000:GOTO181
145 IFL=300RP2=1THENS=SC-50:GOSUB3000:GOTO181
150 IFL=540RL2=22THENP=P+22
160 IFL=460RL2=13THENP=P-1
170 IFL=580RL2=53THENP=P-22
180 IFP1=1190RL2=14THENP=P+1
181 IFPEEK(P+1)>32THENGOTO2000
190 POKEP,21:POKEP-1,32:POKE36877,120+INT((P-7680)/4)
200 GOTO30
1000 POKE52,28:POKE56,28

```

```

1010 FORI=7168T07679:POKEI,PEEK(I+25600):NEXT
1030 FORC=7328T07367:READR:POKEC,R:NEXT
1035 POKE36869,255:RETURN
1040 DATA170,85,170,85,170,85,170,85
1050 DATA0,128,192,224,254,255,255,0
1060 DATA60,60,126,126,255,60,66,129
1070 DATA160,80,168,75,168,80,160,0
1080 DATA0,1,3,7,127,255,255,0
2000 FORI=1T010
2010 POKE36879,I*10
2011 POKE36878,10-I
2012 POKE36877,220
2020 FORK=1T0200:NEXTK
2030 NEXTI
2040 FORL=1T01000:NEXTL
2045 POKE36869,240:PRINT"J"
2050 PRINT"XXXXXXXXXXGAME OVERXX"
2060 PRINT"DO YOU SCORED"SC
2070 PRINT"DO ANOTHER GAME (Y/N)"
2080 GETAF:IFAF=""THEN2080
2081 IFAF="Y"THENJ=8:G=0:P=7904:SC=0:TI#="000000":POKE36869,255:GOTO10
2082 IFAF="N"THENPRINT"J":POKE36869,240:END
2090 GOTO2000
3000 FORM=1T010
3005 POKEN,32
3010 N=P+M*22:POKE36876,150+M*10
3020 IFPEEK(N)=22THENSC=SC+250:POKEN,42:POKE36876,0:RETURN
3030 IFPEEK(N)=20THENPOKEN,42:POKE36876,0:RETURN
3040 POKEN,90:NEXTM:POKEN,32:POKE36876,0:RETURN
4000 SC=SC-100:FORB=1T010:POKEM1,32:M1=P+B:POKE36876,240:POKE36876,0
4010 IFPEEK(M1)=20THENPOKEM1,20:RETURN
4011 IFPEEK(M1)=22THENSC=SC+200:POKEM1,32:RETURN
4012 IFPEEK(M1)=24THENSC=SC+150:POKEM1,32:RETURN
4020 POKEM1,42:POKEM1+30720,1
4030 NEXTB:POKEM1,32:RETURN
5000 FORK=829T0874:READS:POKEK,S:NEXTK:RETURN
5010 DATA169,19,32,210,255,169,29,32,210,255,169,13,32,210,255,169,0,141,60,3
5020 DATA169,29,32,210,255,169,20,32,210,255,169,13,32,210,255,238,60,3,173,60,3
5030 DATA201,21,208,231,96
5040 RETURN

```

BY M. LEVIN

RUNS ON AN

ATOM IN 16K

Warning. This game can impair your sanity.

Written in machine code for an Atom with at least 3K of RAM this program seems designed to either increase your reasoning power or destroy what little sanity you may have left.

You are given a nine square grid with a random number of these squares illuminated. By pressing any of the numeric keys within the range of 1-9, different combination of these squares may be obtained.

The final object being to light up all the squares except the centre one. Should you manage this task you are rewarded by a dizzying display of sight and sound, small consolation for shattered nerves.

```

100INKK0,442
20P.#12"WAIT"#21
30GOS.A:GOS.A:GOS.A
40!#300=#BF00BF!|#304=#000000BF!|#308=#00
50!#310=#00BFBF!|#314=#00000000!|#318=#00
60!#320=#00BFBF00!|#324=#0000BFBF!|#328=#00
70!#330=#0F0000BF!|#334=#00BF0000!|#338=#00
80!#340=#BF00BF00!|#344=#0F00BF!|#348=#00
90!#350=#00BF0000!|#354=#0000BF00!|#358=#0F
100!#360=#BF000000!|#364=#BFBF00BF!|#368=#00
110!#370=#00000000!|#374=#BFBF0000!|#378=#BF
120!#380=#00000000!|#384=#BF00BFBF!|#388=#BF:CLR00
130IFR.X2=0:|#80A7=#FF:IFR.X2=0:|#80AB=#FF:IFR.X2=0:|#80AF=#FF
140IFR.X2=0:|#8107=#FF:IFR.X2=0:|#810B=#FF:IFR.X2=0:|#810F=#FF
150IFR.X2=0:|#8167=#FF:IFR.X2=0:|#816B=#FF:IFR.X2=0:|#816F=#FF
160!#DE=#0025:P."magic"128"square"
170MOVE10,9:DRAW10,35:MOVE27,9:DRAW27,35:MOVE10,18:DRAW35,18
180MOVE10,26:DRAW35,26

```

MAGIC SQUARE

```

190 LINK #3300
195 RUN
200 END
210# P=#3300
220C KK0 JSR#FE3 \ GET KEY
230 CMP#31:BMI KK0
240 CMP#40:BPL KK0
250 AND#0F

```



BREAKOUT!

Ever feel like you're just banging your head up player and the object is to against a brick wall? Do knock as many bricks out you want to break out? of the multicoloured wall Well, here's your chance, as you can by bouncing a Simply program in this ball at it. You get three little number and you'll balls to score as many be able to knock down points as you can. Key '5' walls as quick as your moves your bat left, key computer can build them. '8' moves it right.

BY DAVID HOUNSLOW

RUNS ON A SPECTRUM IN 16K

```
260 ROL A,ROL A      670 CMP#FF
270 ROL A,ROL A      680 BNE KK1
280 STA#00
290 SEC;SBC#10       690 LDA#10B
300 TAX              900 CMP#40
310 LDY#9            910 BNE KK1
320 LDA#00A7         920 LDA#10F
\ COMPLIMENT        930 CMP#FF
330 EOR#300,X        940 BNE KK1
340 STA#00A7         950 LDA#167
350 INX              960 CMP#FF
360 LDA#00AB         970 BNE KK1
370 EOR#300,X        980 LDA#16B
390 STA#00AB         990 CMP#FF
400 LDA#00AF         1000 BNE KK1
410 EOR#300,X        1010 LDA#16F
420 STA#00AF         1020 CMP#FF
430 INX              1030 BNE KK1
440 LDA#0107         1050 LDA#0;STA#40
450 EOR#300,X        ;BCSKK5
460 STA#0107        1051 MW0 LDX#90
470 INX              \BLEEP
480 LDA#010B         1052 MW1 TXA,TAY
490 EOR#300,X        1053 LDA#002
500 STA#010B         1054 EOR#4
510 INX              1055 STA#002
520 LDA#010F         1056 MW2 DEY,BNE MW2
530 EOR#300,X        1057 DEX;BNE MW1
540 STA#010F         1058 RTS
550 INX              1060 KK5 LDA#00A7
560 LDA#0167         \ DISPLAY WIN
570 EOR#300,X        1070 EOR#BF
580 STA#0167         1080 STA#00A7
590 INX              1090 JSR MW0
600 LDA#016B         1100 LDA#00AB
610 EOR#300,X        1110 EOR#BF
620 STA#016B         1120 STA#00AB
630 INX              1130 JSR MW0
640 LDA#016F         1140 LDA#00AF
650 EOR#300,X        1150 EOR#BF
660 STA#016F         1160 STA#00AF
670 BCS KK2          1170 JSR MW0
680 KK1 JMP KK0      1180 LDA#010F
690 KK2 LDY#00AA     1190 EOR#BF
\ BLEEP              1200 STA#010F
700 LDA#002          1210 JSR MW0
710 KK3 LDX#00       1220 LDA#016F
720 KK4 DEX;BNE KK4  1230 EOR#BF
730 EOR#4            1240 STA#016F
740 STA#002          1250 JSR MW0
750 DEY              1260 LDA#016B
760 BNE KK3          1270 EOR#BF
770 LDA#00A7         1280 STA#016B
\ WIN CHECK          1290 JSR MW0
780 CMP#FF           1300 LDA#016F
790 BNE KK1          1310 EOR#BF
800 LDA#00AB         1320 STA#0167
810 CMP#FF           1330 JSR MW0
820 BNE KK1          1340 LDA#0107
830 LDA#00AF         1350 EOR#BF
840 CMP#FF           1360 STA#0107
850 BNE KK1          1370 JSR MW0
860 LDA#0107         1380 DEC#40;BNE KK5
                     1390 RTS
                     1400]
                     1490 RETURN
```

```
1 LET HS=0: LET SS="0000"
5 LET SS=0: PAPER 0; BORDER 0
INK 7; FLASH 0; BRIGHT 0; CLS
PRINT AT 10,2: FLASH 1; DO YOU
want instructions?
6 LET SS=INKEY$: IF AS="" THE
N GO TO 6
9 IF AS="Y" OR AS="y" THEN GO
SUB 600
10 LET SS=0: LET ballsleft=1: L
ET b=5: FOR x=0 TO 7: READ row:
POKE USR "p"+x,row: NEXT x
15 DATA BIN 0011100,BIN 01111
110,255,255,255,255,255,255,255
BIN 0011100
30 RESTORE
40 PAPER 0; INK 6: LET xmove=1
45 LET ymove=-1
50 BORDER 3
52 REM page 1

54 IF SS=280 THEN CLS: LET b
ballsleft=ballsleft-1: LET SS=0:
PRINT AT 10,10: FLASH 1; INK 6:
EXTRA BALL: BEEP,25,20: FOR p=
1 TO 100: NEXT p: IF ballsleft=0
THEN LET ballsleft=1
55 CLS
56 LET bn=0: IF HS THEN LET
HS=5
57 PRINT AT 2,0: PAPER 2: "": p
RINT AT 1,2: PAPER 0; INK 7: "SCO
RE:"; INK 7; SS TO 4-LEN (STR$ (
s));s: INK 7;AT 1,14: "HIGH:";s$
( TO 4-LEN (STR$ (hs)));hs: INK
7;AT 1,31-7: "BALL:"; INK 6;balls
left
60 PRINT AT 3,0: "":AT 10,30
70 FOR y=4 TO 23: FOR x=2 TO 29
STEP 2: PRINT AT y,x: PAPER b+1
y/2=INT (y/2); "": LET b=b+1:
IF b=7 THEN LET b=5
80 NEXT x: NEXT y: PRINT AT y,0
85 FOR y=0 TO 21: PRINT AT y,0
PAPER 2: "":AT y,30: "":NEX
t y: PRINT AT 21,0: PAPER 2: "":A
T 0,0: "
89 PRINT AT 10,0: "":AT 10,30
":AT 17,0: "":AT 17,30: "
90 LET X=15
91 BEEP .5,10: FOR q=1 TO 2: B
EEP .125,11: BEEP .125,12: BEEP
.125,13: BEEP .5,10: NEXT q
95 LET bx=20: LET bx=INT (RAND+
20)/5: IF bx/2=INT (bx/2) THEN G
O TO 95
100 PRINT AT 10,x;bx#
110 GO SUB 300 "": THEN GO TO 100
115 IF INKEY$="" THEN GO TO 100
117 PRINT AT 10,x; "
120 LET X=X+2*(INKEY$="5")-2*(I
```

```

NKEY$="5"): IF X<0 THEN LET X=0
121 IF X>29 THEN LET X=29
130 GO TO 100
300 PRINT AT BY,BX;" "
310 LET BY=BY+YMOVE: LET BX=BX+
XMOVE
500 IF BY<=3 THEN LET YMOVE=1:
501 .01,25
320 IF BX>25 OR BX<3 THEN LET X
MOVE=-XMOVE: BEEP .01,25
325 IF BY>20 THEN LET BALLSLEFT
=BALLSLEFT+1: BEEP .2,30: BEEP
5-35: IF NOT BALLSLEFT=4 THEN
PRINT AT 1,29:BALLSLEFT: LET YM
OVE=-1: LET XMOVE=1: GO TO 95
326 IF BALLSLEFT=4 THEN GO TO 5
00
330 LET ATTR=ATTR (BY,BX)
335 IF ATTR=6 THEN GO TO 410
336 IF ATTR=4 AND YMOVE=-1 THEN
GO TO 410
340 IF (X<=BX<=X+3 OR ATTR=4) A
ND BY=18 AND YMOVE=1 THEN LET YM
OVE=-1: BEEP .01,30: GO TO 310
350 IF ATTR=6 OR ATTR=54 OR at
tr=56 THEN LET YMOVE=1: PRINT AT
TR,BX;" " : IF BX+1<=29 THEN IF
ATTR (BY,BX+1)=attr THEN PRINT A
T BY,BX+1;" " GO TO 370
360 IF BX+1<=29 THEN IF ATTR (BY
,BX+1)=attr THEN PRINT AT BY,BX
+1;" " : attr THEN PRINT AT BY,BX
-1;" " : attr
370 LET BN=BN+1: LET SS=SS+1: L
ET SS=SS+5: PRINT AT 1,8:SS( TO 4-
LEN (STR$ (S))) : S: BEEP .0,1,35:
IF BN=70 THEN GO TO 40

```

```

375 IF S>=9995 THEN LET S=0
380 IF S>HS THEN LET HS=S: PRIN
T AT 1,19:SS( TO 4-LEN (STR$ (hs
))) : HS
381 GO TO 400
410 PRINT AT BY,BX: INK 6;" "
420 RETURN
500 PRINT AT 10,12: FLASH 1: IN
500 "GAMEOVER": FOR X=1 TO 300:
K 6: "GAMEOVER": IF S>HS THEN LET h
NEXT X: CLS : IF S>HS THEN LET h
S=S
501 GO TO 5
600 PAPER 7: INK 0: TAB 12: "BREA
610 " : FOR B=1 TO 6: PRINT CHR$
KOUT" : FOR B=1 TO 6: PRINT OVER 1: INK 2
S: NEXT B
620 BRIGHT 1: " This is a game f
620 PRINT " The object is to kn
or 1 player. The object is to kn
ock as many bricks out of the m
ulticoloured wall as you can: Yo
u do this by stopping the ball f
rom going off the bottom of the s
creen by hitting it with you
r bat. You have 3 balls in whi
ch to score as many points as y
ou can. " : Key 5 Moves your
bat left. " : INK 2: TAB 4: BR
at right. " : INK 2: TAB 4: BR
at left. " : (PRESS ANY KEY TO START)
630 PAUSE 0: LET AS=INKEY$: IF
AS="" THEN GO TO 630
640 RETURN

```

AIR ATTACK

BY IAN STRINGER

RUNS ON AN ATARI 400 IN 16K

You are in command of a giant battleship armed with all the latest weapons. And you are under attack.

Jet fighters, helicopters and armoured balloons are out to do your ship damage.

Your task is to use your supply of missiles - 20 in all - to the best advantage. Shoot down as many of the enemy as possible with the limited supply of weaponry. When your armament is used up the computer shows the high score.

```

1 REM . *** AIR ATTACK ***
2 REM . By Ian Stringer
3 REM . 1982
4 REM
5 DIM Y(4):Y(0)=91:Y(1)=20:Y(2)=30:Y(3)=
40:Y(4)=88:REM Controls vertical positio
n of 4 players
6 X1=100:X2=150:X3=55:X0=100:Q1=-3:Q2=4:
Q3=-2:Q0=2:REM X controls hor. position
of players. Q controls speed
7 B=75:Bl=B:XA=60
10 PMBASE=54279:RAMTOP=106:SDMCTL=559:BR
ACTL=53277:HPOSP0=53248:HPOSP1=53249:HPO
SP2=53250:HPOSP3=53251
20 PCOLR0=704:PCOLR1=705:PCOLR2=706:PCOL
R3=707
30 SIZEP0=53256:SIZEP2=53250:REM Used to
alter width of players 0 & 2
50 P1PF=53253:P2PF=53254:P3PF=53255:REM
Used to detect collisions between playf
ield(missile) & players
90 POKE SIZEP0,1:POKE SIZEP2,1:REM Playe
rs 0 & 2 set to double width
99 REM
100 GRAPHICS 7
110 A=PEEK(RAMTOP)-24:POKE PMBASE,A:MYPM
BASE=256+A:POKE SDMCTL,46:POKE GRACLT,3
120 POKE HPOSP0,X0:POKE HPOSP1,X1:POKE H
POSP2,X2:POKE HPOSP3,X3
125 REM
130 FOR I=MYPMBASE+384 TO MYPMBASE+1024:
POKE I,0:NEXT I:REM Clears P-M RAM

```

```

140 FOR I=MYPMBASE+512+Y(0) TO MYPMBASE+
516+Y(0):READ A:POKE I,A:NEXT I
150 FOR I=MYPMBASE+640+Y(1) TO MYPMBASE+
644+Y(1):READ A:POKE I,A:NEXT I
160 FOR I=MYPMBASE+768+Y(2) TO MYPMBASE+
773+Y(2):READ A:POKE I,A:NEXT I
170 FOR I=MYPMBASE+896+Y(3) TO MYPMBASE+
905+Y(3):READ A:POKE I,A:NEXT I
180 REM Lines 140-170 read player data i
nto P-M RAM
190 POKE PCOLR0,88:POKE PCOLR1,26:POKE P
COLR2,138:POKE PCOLR3,186
191 POKE 752,1:SH=20:REM 752,1 removes c
ursor
192 GOSUB 1600
196 GOSUB 1500
199 REM
200 GOSUB 1000:REM MOVE TARGET
210 IF STRIG(0)=0 THEN ST=1
220 IF ST=1 THEN GOSUB 1200:REM BULLET
230 GOSUB 1100:REM MOVE SHIP
240 GOSUB 1300:REM CHECK HITS
250 IF SH=0 THEN GOSUB 1410
300 GOTO 200
1000 X1=X1+Q1:POKE HPOSP1,X1:IF X1<35 TH
EN X1=220
1010 X2=X2+Q2:POKE HPOSP2,X2:IF X2>220 T
HEN X2=35
1020 X3=X3+Q3:POKE HPOSP3,X3:IF X3>215 O
R X3<35 THEN Q3=-Q3
1090 RETURN
1100 F=230:IF STICK(0)=11 THEN X0=X0-Q0:

```

```

F=170
1110 IF STICK(0)=7 THEN X0=X0+00:F=180
1115 IF X0>199 THEN X0=199
1116 IF X0<40 THEN X0=40
1120 POKE HPOS0,X0:SOUND 3,F,6,10
1130 RETURN
1200 COLOR 0:PLOT XA,B
1210 B=B-2:COLOR 1:PLOT X0-40,B:XA=X0-40
1220 SOUND 0,B,10,14
1250 IF B<2 THEN COLOR 0:PLOT XA,B:B=75:
ST=0:SH=SH-1
1290 RETURN
1300 IF PEEK(P1PF)<>0 THEN HIT=1:GOTO 13
40
1310 IF PEEK(P2PF)<>0 THEN HIT=2:GOTO 13
40
1320 IF PEEK(P3PF)<>0 THEN HIT=3:GOTO 13
40
1340 IF HIT=0 THEN 1390
1345 FOR S=20 TO -20 STEP -1:SOUND 0,ABS
(S),8,12:NEXT S
1350 IF HIT=1 THEN SC=SC+30:X1=30
1355 IF HIT=2 THEN SC=SC+15:X2=225
1360 IF HIT=3 THEN SC=SC+5:X3=43:Q=1
1385 COLOR 0:PLOT XA,B
1389 SOUND 0,0,0,0:ST=0:B=75:HIIT=0:POKE
53278,1:SH=SH-1
1390 POKE 656,1:POKE 657,9: ? SC
1395 POKE 656,1:POKE 657,30: ? SH: " "
1400 RETURN
1410 OPEN #1,4,0,"K":SOUND 3,0,0,0
1415 ? " )"
1420 POKE 656,1:POKE 657,2: ? " YOU SCOR
ED "1SC;" IN 20 SHOTS. PL
AY AGAIN (Y/N)":GET #1,K
1425 IF K=255 THEN 1420
1430 IF K<>89 THEN END
1435 IF SC>HSC THEN HSC=SC
1440 SC=0:SH=20
1480 ? " )"
1486 GOSUB 1500
1488 POKE 656,2:POKE 657,14: ? HSC
1489 CLOSE #1
1490 RETURN
1500 POKE 656,1:POKE 657,3: ? "SCORE"
1510 POKE 656,1:POKE 657,24: ? "SHOTS"
1520 POKE 656,2:POKE 657,3: ? "HIGH SCORE
"
1550 RETURN
1600 XX=0:POKE 656,0:POKE 657,10: ? "***
AIR ATTACK ***":SOUND 0,255,10,8:SOUND 1
,254,10,8
1619 XX=XX+1:IF XX>10 THEN 1630
1620 POKE 656,2:POKE 657,13: ? "Press STA
RT"
1630 IF PEEK(53279)=6 THEN 1690
1640 GOSUB 1000
1649 IF XX<10 THEN 1680
1650 POKE 656,2:POKE 657,19: ? " "
1651 IF XX>20 THEN XX=0
1680 GOTO 1619
1690 SOUND 0,0,0,0:SOUND 1,0,0,0: ? " )":R
ETURN
2999 REM
3000 DATA 8,8,30,63,255,253,51,94,120,12
0,128,192,254,255,12,56,60,126,255,255,2
55,189,66,36,60,60

```

WORLD CUP

BY G. R. JOHNSON

RUNS ON A BBC MODEL B IN 32K

Remember the World Cup? Those heady summer days when England still had it all to play for and everyone was saying that this time the lads could pull it off . . .

Well they didn't quite make it did they? And now there's another four years to wait until the next one. Still, you can fill in the time by programming in our version of the World Cup conflict.

By special request we're reprinting one of C&VG's most popular program listings - first published in June last year. But this time we've adapted it so all you BBC owners out there can become soccer supremos.

World Cup Manager sets out to give you all the frustrations of sitting on the bench when the national side you manage go a goal down 20 minutes from time in a crucial match.

Hopefully, with some careful attention to tactics and good substitutions in critical games, it should give you all the elation of guiding your coun-

try's team through to the championships of the World Cup Finals.

It will let you manage any of the 24 countries involved in the 1982 World Cup but expect to have a more difficult time if you pick El Salvador than if you choose Brazil.

It invites you to enter your team and then publishes the draw for the competition with initially six groups of four. Set out the countries you think will be stumbling blocks to your continuation in the competition and send off your scouts to watch them.

Remember you can get through by finishing second in your group so it may not be necessary to watch all three teams in your group. The first game comes up and a dossier on the opposition is printed out. Pay careful attention because you will have to find good tactical answers to the opposition's plays.

There are other considerations too, choose your formation carefully and if you need to boost your goal differ-

ence to quality, try to manufacture an open game.

Then it's out of your hands and the two teams are up against one another with a running commentary of events. Keep a close check on which of your players seem to lose possession and play badly, these are the one's you will want to substitute.

Also watch for which team is gaining the most possession in midfield - you may need to change tactics.

Check on how the goals are scored - it could be important to tighten up your defence to certain situations or to find out which of your own attacking plays is paying dividends.

Half-time comes around and this is your chance to change your tactics if you have noticed things going wrong.

At the end of the day, win, lose or draw, you will have to sit back and watch the other results of the day being typed out and see if your predictions are coming true.

```

10 *TV 255.1
20 MODE 7
30 DIM K$(12)
40 J$=STRING$(150,"?"):J$=""
50 E1=0:E2=0:K3=0:X5=0
60 DIM D(4),W(4),D9(4),F9(4),A9(4),HX(4,3),DB(4),T9(4),P9(4),RX(24),SB(4),N1
(2),GX(24),DX(6,4),AK(3,3),BK(3,3),CK(3,3),DX(3,3),T4$(20),A$(24),F$(24),I$(3,3),
JK(3,3),NK(24,21),XK(24),TK(24),UK(24),VK(24),WK(24),XK(24),YK(24)
70 DIM ZK(24),Z9$(12),A1$(9),A2$(9),EX(11):V=0:B4=0
80 DEF FNA(X)=INT(RND(1)*X)+1
90 DATA BRAZIL,ARGENTINA,W.GERMANY,YUGOSLAVIA,HUNGARY,BELGIUM,ITALY,POLAND,F
RANCE,CZECHOSLOVAKIA,SPAIN,ENGLAND,SCOTLAND,N.IRELAND,PERU,AUSTRIA,CHILE,EL SALV
ADOR,HONDURAS,ALGERIA,N.ZEALAND,CAMEROON,KUWAIT,RUSSIA
100 DATA 1,1,0,1,2,1,0,0,0,0,0,1,1,2,1,0,2,2
110 DATA " HITS THE BALL TOO FAR AHEAD OF "," 'S PASS IS MISCONTROLLED BY ","
LOSES THE BALL IN A MISUNDERSTANDING WITH "," HITS A LONG BALL TO "," PASSES WID
E TO "," CROSSES TO "," PLAYS A HIGH BALL TO "," COLLECTS A PASS FROM "
120 DATA " PLAYS A ONE-TWO WITH "," IS SENT AWAY BY "," WINS A FREE KICK FROM
"," MOVES INSIDE "," SWERVES PAST "," DUMMIES "," RUNS ROUND "," RACES PAST ","
SHRUGS OFF A CHALLENGE FROM "," IS TACKLED BY "," 'S PASS IS CUT OUT BY "
130 DATA " 'S CROSS IS HEADED AWAY BY ",5,15,30,30,5,15,30,5,15,30,5,15,5,3
0,30,15,5,5,30,15,15,5,30,30,15,5," 'S CHIP FOR GOAL IS HEADED AWAY BY "," LOSES T
HE BALL TO "," IS TACKLED BY "," 'S VOLLEY IS PUNCHED CLEAR BY"
140 DATA " 'S FIERCE DRIVE IS WELL SAVED BY "," BLASTS THE BALL WIDE "," ROUNDS
THE KEEPER AND MISKICKS "," BEATS TWO DEFENDERS AND SHOOTS WIDE "," STUMBLES AN
D LOSES THE BALL "," 'S CHIP FOR GOAL FINDS THE BACK OF THE NET"
150 DATA " BLASTS THE BALL HOME "," VOLLEYS INTO THE ROOF OF THE NET "," TAPS T
HE BALL IN FROM 5 YARDS "," HITS A LOW SHOT INTO THE NET "," 'S SHOT BOUNCES UNDER
THE KEEPER "," 'S SOFT SHOT IS DROPPED BY THE KEEPER "," LETS FLY WITH A LONG SHOT"
160 DATA " STEPS INSIDE THE FULLBACK, ROUNDS THE KEEPER AND SLOTS HOME"
170 PROC SORT:CLS:PRINT"CHOOSE YOUR TEAM-ENTER A NO. FROM LIST"
180 X=1:PROC CHOOSE:PROC TEAM
190 CLS:PRINT"NOW KEY IN THE NAMES OF YOUR PLAYERS":PRINT CHR$(136);"--MAXIMUM
M OF 15 LETTERS--"

```

```

200 FOR I=1 TO D12
210 IF I=1 THEN PRINT"GOALKEEPER "
220 IF I=1 AND I(6) THEN PRINT"MIDFIELD "+STR$(I-1)
230 IF I=1 AND I(9) THEN PRINT"DEFENDER "+STR$(I-1)
240 IF I=1 AND I(12) THEN PRINT"STRIKER "+STR$(I-1)
250 IF I=12 THEN PRINT"SUBSTITUTE "
260 INPUT K$(1)
270 IF LEN(K$(1))>15 THEN PRINT"NAME IS TOO LONG.RE-ENTER.":GOTO 260
280 NEXT I
290 CLS:PRINT "YOU ARE MANAGER OF ":CHR$(136):A$(T)
300 PRINT "YOUR AIM IS TO WIN THE 1982 WORLD CUP"
310 PROC WAIT
320 FOR I=1 TO D6
330 S=0
340 Y=FNA(24)
350 IF GX(Y)() THEN GOTO 340
360 S=S+1
370 GX(Y)=1:DX(I,S)=Y
380 IF S=4 THEN GOTO 400
390 GOTO 340
400 NEXT I
410 CLS:PRINT"THE DRAW IS:--"
420 FOR I=1 TO D3
430 PRINT:PRINT "GP. "STR$(I);TAB(20);"GP. ";STR$(I+3):PRINT
440 FOR J=1 TO 4
450 PRINTA$(DX(I,J));TAB(20);A$(DX(I+3,J))
460 NEXT J:NEXT I
470 PRINT

```

```

480 PROC CONTINUE:PROC SCOUT:PROC FIXTURE:PROC SECSTAGE:PROC CONTINUE:PROC SEC FIXT:
PROC SEMI:PROC SEMI PLAY:PROC FINAL
490 PROC CONTINUE
500 IF E2)E1 THEN B2=X2+B3=X1
510 IF E1)E2 THEN B2=X1+B3=X2
520 CLS:PRINTTAB(0,6)"CONGRATULATIONS TO:--":PRINTTAB(10,10);CHR$(136);A$(B2)

```

```

530 PRINTTAB(0,15);"1982 WORLD CUP WINNERS"
540 PRINTTAB(0,21);"DO YOU WISH TO PLAY AGAIN?"
550 INPUT "TYPE 'Y' OR 'N' " S#
560 IF ASC(S#)=89 THEN CLS:FRUN
570 IF ASC(S#)=78 THEN CLS
580 IF ASC(S#) < 89 AND ASC(S#) < 78 THEN GOTO 550

```

```

590 END
600 DEFPROCSDRT
610 FOR I=1TD24
620 F#(I)=INT(RND(1)*3)+1
630 READ A#(I)
640 X#(I)=FNA(3)
650 Y#(I)=FNA(3)
660 Z#(I)=FNA(3)
670 T#(I)=FNA(3)
680 U#(I)=FNA(3)
690 V#(I)=FNA(3)
700 W#(I)=FNA(3)
710 NEXT I
720 FOR I=1TD3
730 FOR J=1TD3
740 D#(I,J)=10
750 READ I#(I,J):READ J#(I,J)
760 NEXT J:NEXT I
770 FOR I=1TD20
780 READ T#(I)
790 NEXT I
800 FOR I=1TD3
810 FOR J=1TD3
820 READ A#(I,J)
830 READ B#(I,J)
840 READ C#(I,J)
850 NEXT J:NEXT I
860 FOR I=1TD3
870 R#(I)=INT(RND(1)*10)+21
880 NEXT I
890 FOR I=4TD11
900 R#(I)=INT(RND(1)*10)+16
910 NEXT I
920 FOR I=12TD14

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930 R#(I)=20
940 NEXT I
950 FOR I=15TD17
960 R#(I)=INT(RND(1)*5)+16
970 NEXT I
980 FOR I=18TD23
990 R#(I)=INT(RND(1)*5)+11
1000 NEXT I
1010 R#(24)=INT(RND(1)*22)+11
1020 D#(1,1)=5
1030 D#(3,3)=15
1040 FOR I=1TD12
1050 Z#(I)=" ND. "+STR#(I)
1060 NEXT I
1070 Z#(1)="THEIR GOALKEEPER "
1080 FOR I=1TD9
1090 READ A1#(I)
1100 NEXT I
1110 FOR I=1TD9
1120 READ A2#(I)
1130 NEXT I
1140 ENDPROC
1150 DEF PROCCHOOSE
1160 FOR I=1TD12
1170 IF X=1 THEN GOTO 1240
1180 IF (T-I)*(T-12-I) < 0 THEN GOTO 1240
1190 IF T=I+12 THEN GOTO 1220
1200 PRINTTAB(20);STR#(I+12);". ";A#(I+12)
1210 GOTO 1250
1220 PRINTSTR#(I);". ";A#(I)
1230 GOTO 1250
1240 PRINT STR#(I);". ";A#(I);TAB(20);STR#

```

```

(I+12);". ";A#(I+12)
1250 NEXT I
1260 PRINT:PRINT
1270 ENDPROC
1280 DEF PROCTEAM
1290 INPUT"WHICH TEAM?"T#
1300 T=VAL(T#)
1310 IF T<1 THEN GOTO 1340
1320 IF T>24 THEN GOTO 1340
1330 GOTO 1360
1340 PRINT"ENTER A NO. BETWEEN 1 & 24"
1350 GOTO 1290
1360 ENDPROC
1370 DEF PROCWAIT
1380 TIME=0:REPEAT:UNTIL TIME=400
1390 ENDPROC
1400 DEF PROCCONTINUE
1410 PRINT"PRESS ANY KEY TO CONTINUE"
1420 Z#=#GET#
1430 IF Z#="" THEN 1420
1440 ENDPROC
1450 DEF PROCSCOUT
1460 CLS
1470 PRINT"SCOUTS CAN COMPILE DOSSIERS ON 4 TEAMS"
1480 PRINT"ENTER 4 NOS. FROM THE FOLLOWING:"
1490 PRINT"SEPARATED BY COMMAS":PRINT"*****":PRINT
1500 X=2
1510 PROCCHOOSE
1520 INPUT S1,S2,S3,S4
1530 IF (S1-T)*(S2-T)*(S3-T)*(S4-T)=0 THEN GOTO 1570
1540 IF (S1-S2)*(S1-S3)*(S1-S4)*(S2-S3)*(S2-S4)*(S3-S4)=0 THEN 1570
1550 IF S1(1 OR S1)24 OR S2(1 OR S2)24 OR S3(1 OR S3)24 OR S4(1 OR S4)24 THEN

```



```

1930 IF W6=4 THEN PROCX
1940 IF W6=4 THEN GOTO 1960
1950 K1=1:K2=3:J1=4
1960 FOR I=1TOW6
1970 PROCPOS
1980 PROCPOSPRINT
1990 NEXT I
2000 ENDPROC
2010 DEF PROCPOS
2020 FOR J=1TOJ1
2030 D(J)=0:F9(J)=0:A9(J)=0:P9(J)=0:W(J)=0:D8
(J)=0:D9(J)=0
2040 NEXT J
2050 FOR J=1TOJ1
2060 T9(J)=D8(I, J)
2070 FOR K = K1 TO K2
2080 IF MX(T9(J), K)=0 THEN GOTO 2190
2090 F9(J)=MX(T9(J), K)+F9(J)
2100 A9(J)=MX(T9(J), K+14)+A9(J)
2110 Z7=MX(T9(J), K+7)
2120 Z6=MX(T9(J), K+14)
2130 D8(J)=Z7-Z6+D8(J)
2140 D(J)=D(J)+1
2150 IF Z7=Z6 THEN D9(J)=D9(J)+1
2160 IF Z6(Z7 THEN W(J)=W(J)+1
2170 IF Z6(Z7 THEN P9(J)=P9(J)+2
2180 IF Z6=Z7 THEN P9(J)=P9(J)+1
2190 NEXT K
2200 NEXT J
2210 F2=0
2220 FOR J=1TOJ1-1
2230 IF P9(J) (P9(J+1) THEN PROCSSWAP
2240 IF P9(J) = P9(J+1) THEN PROCGOALDIFF
2250 NEXT J
2260 IF F2=1 THEN GOTO 2210
2270 ENDPROC
2280 DEF PROCGOALDIFF
2290 IF D8(J) (D8(J+1) THEN PROCSSWAP
2300 IF D8(J) () D8(J+1) THEN ENDPROC
2310 IF F9(J) (F9(J+1) THEN PROCSSWAP
2320 IF F9(J) () F9(J+1) THEN ENDPROC
2330 IF FNA(2)=1 THEN PROCSSWAP
2340 ENDPROC
2350 DEF PROCSSWAP
2360 F3=T9(J):T9(J)=T9(J+1):T9(J+1)=F3
2370 F3=F9(J):F9(J)=F9(J+1):F9(J+1)=F3
2380 F3=A9(J):A9(J)=A9(J+1):A9(J+1)=F3
2390 F3=D8(J):D8(J)=D8(J+1):D8(J+1)=F3
2400 F3=D9(J):D9(J)=D9(J+1):D9(J+1)=F3
2410 F3=P9(J):P9(J)=P9(J+1):P9(J+1)=F3
2420 F3=W(J):W(J)=W(J+1):W(J+1)=F3
2430 F3=D(J):D(J)=D(J+1):D(J+1)=F3
2440 F2=1
2450 ENDPROC
2460 DEF PROCPOSPRINT
2470 PRINT
2480 F$="F " :A4$=" A "
2490 IF W6=6 THEN B$=CHR$(I+48)
2500 IF W6=4 THEN B$=CHR$(I+64)
2510 PRINT"GP. " :B$;" LEAGUE TABLE"
2520 FOR J=1TOJ1
2530 IF F9(J)>9 THEN F$=" F "
2540 IF A9(J)>9 THEN A4$=" A "
2550 NEXT J
2560 PRINTTAB(20); " P W D L " :F$:A4$;"Pts. "
2570 FOR J=1TOJ1
2580 P4$=" " :P5$=" "
2590 L9=D(J)-W(J)-D9(J)
2600 IF F$=" F " THEN GOTO 2770
2610 IF A4$=" A " THEN GOTO 2790
2620 Y1$=STR$(J)+". " :A$=(T9(J))
2630 PRINTY1$:TAB(21);D(J); " " :W(J); " " :D9(J); " "
:L9;P4$:F9(J);P5$:A9(J); " " ;

```



```

GOTO 1570
1560 ENDPROC
1570 PRINT"RE-ENTER 4 NOS.
FROM ABOVE LIST"
1580 GOTO1520
1590 ENDPROC
1600 DEF PROCFIGURE
1610 W6=6
1620 D1=12
1630 H2=1:A2=2:PROCRESULT
1640 H2=3:A2=4:PROCRESULT
1650 H2=1:A2=3:PROCRESULT
1660 H2=2:A2=4:PROCRESULT
1670 H2=1:A2=4:PROCRESULT
1680 H2=2:A2=3:PROCRESULT
1690 ENDPROC
1700 DEF PROCRESULT
1710 D1=D1+1
1720 PROCPLAYCHECK
1730 CLS
1740 PRINT"RESULTS FOR " :D1;" JUNE '82"
1750 PRINT
1760 FOR I=1TOW6
1770 H=O8(I, H2) :A=O8(I, A2)
1780 IF H=I THEN B=P2:C=P3:GOTO 1810
1790 IF T=A THEN B=P3:C=P2:GOTO 1810
1800 GOSUB 2820
1810 PRINT"GP. " :I; " " :A$(H); " " :B;
" " :A$(A); " " :C

```

```

1820 NEXT I
1830 IF D1=18 THEN PROCCONTINUE:PROCTABLE
1840 PRINT
1850 IF D1=18 THEN ENDPROC
1860 PRINT"PRESS 'L' FOR LEAGUE TABLES"
1870 PRINT" ANY OTHER KEY TO CONTINUE"
1880 Z$=GET$
1890 IF Z$="" THEN GOTO 1880
1900 IF Z$="L" THEN PROCTABLE
1910 ENDPROC
1920 DEF PROCTABLE

```

```

2640 IF W6+J-5=0 THEN PROCSEMITEAM
2650 IF W6=4 THEN 2670
2660 IF J(3 THEN PROCY
2670 NEXT J
2680 IF W6=6 THEN 2710
2690 IF I(4 THEN 2760
2700 GOTO 2730

```

```

3320 IF J=2 THEN HX(3,2)=T9(J)
3330 GOTO 3240
3340 IF J=1 THEN HX(3,3)=T9(J)
3350 IF J=2 THEN HX(1,3)=T9(J)
3360 GOTO 3240
3370 IF J=1 THEN HX(4,2)=T9(J)
3380 IF J=2 THEN HX(2,2)=T9(J)
3390 GOTO 3240
3400 IF J=1 THEN HX(2,3)=T9(J)
3410 IF J=2 THEN HX(4,3)=T9(J)
3420 GOTO 3240
3430 DEF PROCDPPVAL
3440 IF DX(1,H2)() THEN Z=DX(1,H2)
3450 IF DX(1,H2)=T THEN Z=DX(1,A2)
3460 PROCGAMEPLAY
3470 ENDPROC
3480 DEF PROCGAMEPLAY
3490 CLS:PRINTA$(T);" V. ";A$(Z):PRINT
3500 B=0:C=0:B4=0:B5=0:B6=0
3510 PROCSCOUTREP:PROCTACTSEL:
PROCDPPTEAM
3520 Z3=0:Z4=0:W1=0
3530 K4=DX(ZX(T),Z3(Z))+30:
W3=RX(T):W4=RX(Z)
3540 W3=W3+2*1X(FX(T),
FX(Z)):W4=W4+2*1X(FX(Z),FX(T))
3550 FOR I=1TO11:EX(I)=0:NEXT I
3560 U1=0
3570 CLS:PRINT"THE REF BLOWS HIS
WHISTLE TO START GAME"
3580 FOR I=1TOK4
3590 Z1=T
3600 IF FNA(W3+W4):RX(T) THEN Z1=Z
3610 IF Z1=T THEN Z8=Z
3620 IF Z1=Z THEN Z8=T
3630 PROCDETPOSS
3640 Z8$=" HAVE "
3650 PROCPOSSREG
3660 PRINTA$(Z1):Z8$:"POSSESSION":PRINT
3670 IF Z1=T THEN PROCPLAYRAN
3680 IF Z1=Z THEN PROCRRANPLAY
3690 J#=Z5#+T4$(G1)+Z6$:PROCMOVEPRI
3700 PRINT:PROCWAIT
3710 Z4=Z2:Z3=Z1
3720 IF Z2=1 THEN U1=U1+1:EX(A3)=EX(A3)+1
3730 IF Z2=2 THEN PROCSCORCHAN
3740 IF I=22 THEN PROCALTIM
3750 NEXT I
3760 H=T:A=Z
3770 PRINT"NOTHING ELSE OF SIGNIFICANCE
HAPPENS DURING THE GAME"
3780 PRINT:PRINT"FINAL SCORE"
3790 PRINTA$(T);" ";B;" ";A$(Z);" ";C
3800 P2=B:P3=C:PROCCONTINUE
3810 IF X3=0 THEN GOSUB 2990:ENDPROC
3820 IF B=C THEN 3850
3830 IF V=0 THEN ENDPROC
3840 GOSUB 2990:ENDPROC
3850 IF X5=1 THEN 3900
3860 Z3=0:Z4=0:K4=15
3870 X5=1
3880 CLS:PRINT"EXTRA TIME BEING PLAYED"
3890 GOTO 3580
3900 X5=0
3910 CLS:PRINT"PENALTIES WILL DECIDE THE RESULT"
3920 J$=" SHOOT'S WIDE"
3930 IF RND(1)>.5 THEN B=B+1:J$=" SCORES FROM THE SPOT"
3940 J#=K*(1+FNA(10))+J$:PROCMOVEPRI
3950 J$=" SHOOT'S WIDE"
3960 IF RND(1)>.5 THEN C=C+1:J$=" SCORES FROM THE SPOT"
3970 J#=Z9*(1+FNA(10))+J$:PROCMOVEPRI
3980 IF B=C THEN 3920
3990. PRINT"FINAL SCORE ";PRINTA$(T);" ";B;" ";A$(Z);" ";C
2710 IF I<3 THEN 2760
2720 IF (I-4)*(I-5)=0 THEN 2760
2730 PRINT"PRESS ANY KEY TO CONTINUE"
2740 Z$=GET$
2750 IF Z$="" THEN GOTO 2740
2760 ENDPROC
2770 IF F9(J)() THEN P4$=" "
2780 GOTO 2610
2790 IF A9(J)() THEN P5$=" "
2800 GOTO 2620
2810 ENDPROC
2820 B=0:C=0
2830 IF FNA(100)() THEN GOTO 2850
2840 B=1X(FX(H),FX(A)):C=JX(FX(H),FX(A))
2850 B1=FNA(B):C1=FNA(B)
2860 B1=B1+RX(H):C1=C1+RX(A)
2870 D=INT((ABS(B1-C1))/5)
2880 IF D() THEN 2950
2890 B=B-FNA(2)-1
2900 C=C+FNA(2)-1
2910 IF FNA(2)=2 THEN GOTO 2990
2920 IF RX(H):RX(A) THEN B=B+FNA(2)-1
2930 IF RX(A):RX(H) THEN C=C+FNA(2)-1
2940 GOTO 2990
2950 IF B1()C1 THEN B=B+D
2960 IF C1()B1 THEN C=C+D
2970 IF FNA(500)()498 THEN B=B+FNA(3)
2980 IF FNA(500)()498 THEN C=C+FNA(3)
2990 NX(H)=NX(H)+1:NX(A)=NX(A)+1
3000 MX(H,NX(H))=A
3010 MX(A,NX(A))=H
3020 MX(H,NX(H)+7)=B
3030 MX(A,NX(A)+7)=C
3040 MX(H,NX(H)+14)=C
3050 MX(A,NX(A)+14)=B
3060 RETURN
3070 DEF PROCPLAYCHECK
3080 FOR I=1TOW6
3090 IF (DX(1,H2)-T)*(DX(I,A2)-T)=0
THEN PROCDPPVAL
3100 NEXT I
3110 ENDPROC
3120 DEF PROCX
3130 K1=4:K2=5:J1=3
3140 FOR I=1TO4
3150 FOR J=1TO3
3160 DX(I,J)=HX(I,J)
3170 NEXT J:NEXT I
3180 ENDPROC
3190 DEF PROCSEMTTEAM
3200 S8(I)=T9(J)
3210 ENDPROC
3220 DEF PROCY
3230 ON I GOTO 3250,3280,3310,3340,
3370,3400
3240 ENDPROC
3250 IF J=1 THEN HX(1,1)=T9(J)
3260 IF J=2 THEN HX(3,1)=T9(J)
3270 GOTO 3240
3280 IF J=1 THEN HX(2,1)=T9(J)
3290 IF J=2 THEN HX(4,1)=T9(J)
3300 GOTO 3240
3310 IF J=1 THEN HX(1,2)=T9(J)

```



```
4000 P2=B:P3=C
4010 ENDPROC
4020 DEF PROCSCOUTREP
4030 D4=0
4040 IF (Z-S1)*(Z-S2)*
(Z-S3)*(Z-S4)=0 THEN D4=1
4050 IF D4=1
THEN J8="YOUR SCOUTS
REPORT ON "+A$(Z):PROCMOVEPRI
4060 E=Z
4070 IF D4=1 THEN PROCCONTINUE
4080 PROCREP:ENDPROC
4090 DEF PROCTACTSEL
4100 CLS:PRINT"WHAT FORMATION
SHALL WE PLAY BOSS?"
```

```
4420 PROCFREEDEF
4430 PRINTF1;" ";C%
4440 NEXT F1
4450 PROCZ:UX(T)=E9:PRINT
4460 PRINT"WHAT SHALL WE DO WITH
OUR CORNERS?"
4470 FOR F1=1TO3
4480 PROCCORNTACT
4490 PRINTF1;" ";C%
4500 NEXT F1
4510 PROCZ:VX(T)=E9:PRINT
4520 PRINT"WHAT ABOUT THEIR CORNERS?"
4530 FOR F1=1TO3
4540 PROCCORNEDEF
4550 PRINTF1;" ";C%
4560 NEXT F1
4570 PROCZ:WX(T)=E9
4580 ENDPROC
4590 DEF PROCOPTEAM
4600 CLS:PRINT"DO YDU WISH TO TYPE
IN THE OPPOSITION PLAYERS' NAMES?"
4610 INPUT"TYPE Y OR N "D3%
4620 IF ASC(LEFT$(D3%,1))=78 THEN
PROCCORNAME:ENDPROC
4630 IF ASC(LEFT$(D3%,1))>89 THEN 4610
4640 FOR I=1TO12
4650 PRINT"ENTER NAME OF PLAYER ";I:
IF I=1 THEN
PRINT CHR$(136);"--MAXIMUM OF 5 LETTERS--"
4660 INPUT Z9$(I)
4670 IF LEN(Z9$(I))>15 THEN PRINT"NAME
IS TOO LONG. RE-ENTER.":GOTO 4660
```

```
5030 NEXT J
5040 GOTO 4980
5050 ENDPROC
5060 DEF PROCSCORCHAN
5070 Z4=1:G3=FNA(7)
5080 IF G1(8) THEN Z1%=Z6%
5090 IF G1(7) THEN Z1%=Z5%
5100 ON G3 GOSUB 5120,5120,5120,5120,5120,5160,5160,5250
5110 ENDPROC
5120 G3=FNA(100)
5130 IF C$(Y$(Z3),X$(Z8))100-G3+B4 THEN PROCGOAL:RETURN
5140 PROCRA
```

```
4110 FOR F1=1TO3
4120 PROCDFORM
4130 PRINTF1;" ";C%
4140 NEXT F1
4150 PROCZ:F$(T)=E9:PRINT
4160 PRINT"WHAT ARE THE DEFENCE PLANS BOSS?"
4170 FOR F1=1TO3
4180 PROCCDEFACT
4190 PRINTF1;" ";C%
4200 NEXT F1
4210 PROCZ:YX(T)=E9:PRINT
4220 PRINT"WHAT ATTACK PLANS GUV?"
4230 FOR F1=1TO3
4240 PROCCATTACT
4250 PRINTF1;" ";C%
4260 NEXT F1
4270 PROCZ:YX(T)=E9:PRINT
4280 PRINT"WHAT ABOUT MIDFIELD BOSS?"
4290 FOR F1=1TO3
4300 PROCCMIDTACT
4310 PRINTF1;" ";C%
4320 NEXT F1
4330 PROCZ:Z$(T)=E9:PRINT
4340 PRINT"WHAT IF WE GET A FREEKICK UPFIELD BOSS?"
4350 FOR F1=1TO3
4360 PROCFREETACT
4370 PRINTF1;" ";C%
4380 NEXT F1
4390 PROCZ:TX(T)=E9:PRINT
4400 PRINT"HOW DO WE DEFEND AGAINST A FREEKICK?"
4410 FOR F1=1TO3
```

```
4680 NEXT I
4690 ENDPROC
4700 DEF PROCDETPOSS
4710 G1=FNA(20)
4720 IF G1(4) THEN Z2=1
4730 IF G1(4) THEN ENDPROC
4740 IF G1(1) THEN Z2=1
4750 IF G1(1) THEN ENDPROC
4760 Z2=2:ENDPROC
4770 DEF PROCCOSSREG
4780 IF Z4(1) THEN ENDPROC
4790 IF Z3(1) THEN ENDPROC
4800 Z8%=" REGAIN "
4810 ENDPROC
4820 DEF PROCPLAYRAN
4830 A3=FNA(10)+1:Z5%=K$(A3)
4840 IF G1(1) THEN Z6%=Z9%(FNA(10)+1)
4850 IF G1(1) THEN ENDPROC
4860 A4=FNA(10)+1
4870 IF A4=A3 THEN 4860
4880 Z6%=K$(A4)
4890 ENDPROC
4900 DEF PROCANPLAY
4910 A3=FNA(10)+1:Z5%=Z9%(A3)
4920 IF G1(1) THEN Z6%=K$(FNA(10)+1)
4930 IF G1(1) THEN ENDPROC
4940 A4=FNA(10)+1
4950 IF A4=A3 THEN 4940
4960 Z6%=Z9%(A4):ENDPROC
4970 DEF PROCMOVEPRI
4980 IF LEN(J%)=(39 THEN PRINTJ%
4990 IF LEN(J%)<39 THEN PRINT
5000 IF LEN(J%)>39 THEN ENDPROC
5010 FOR J=39TO1 STEP-1
5020 IF ASC(MID$(J%,J,1))=32 THEN PRINT
LEFT$(J%,J):J%=RIGHT$(J%,LEN(J%)-J):J%=0
```




```

5150 RETURN
5160 PRINT:PRINTA$(Z1):" WIN A CORNER"
5170 IF Z1=T THEN Z1#=K$(5+FNA(6))
5180 IF Z1=Z THEN Z1#=Z9$(5+FNA(6))
5190 J$="FROM THE KICK THE BALL REACHES"+" "+Z1$
5200 PROCMOVEPRI
5210 G3=FNA(100)
5220 IF B$(Y$(Z3),X$(Z8))100-G3+B6 THEN B6=B6+2:PROCGOAL:RETURN
5230 PROCRA
5240 RETURN
5250 PRINT
5260 IF Z1=T THEN Z5#=Z9$(1+FNA(4))
5270 IF Z1=Z THEN Z5#=K$(1+FNA(4))
5280 J$=Z1$+" IS BROUGHT DOWN BY "+Z5$+" THE REF AWARDS "+A$(Z1)
5290 J$=J$+" A FREEKICK JUST OUTSIDE THE BOX":PROCMOVEPRI
5300 PRINT:PRINT"FROM THE FREEKICK "
5310 G3=FNA(100)
5320 IF C$(Y$(Z3),X$(Z8))100-G3+B5 THEN B5=B5+2:PROCGOAL:RETURN
5330 PROCRA
5340 RETURN
5350 DEF PROCHALTIM
5360 PRINT:PRINT"HALFTIME SCORE:"
5370 PRINTA$(T):" ";B:" ";A$(Z):" ";C
5380 PRINT"DO YOU WISH TO CHANGE TACTICS?"
5390 INPUT "TYPE 'Y' OR 'N' " Z$
5400 IF ASC(LEFT$(Z$,1))<78 AND ASC(LEFT$(Z$,1))>89 THEN 5390
5410 IF ASC(LEFT$(Z$,1))=89 THEN PROCTACTSEL
5420 PROCSUB:ENDPROC
5430 DEF PROCREP
5440 PRINT"PROFILE ON ";A$(E):PRINT
5450 PROCPOSTRES
5460 PRINT:F1=X$(E)
5470 PROCDEFTACT
5480 PRINT
5490 PRINT"IN DEFENCE THEY":C$:PRINT
5500 F1=Y$(E):PROCTACT
5510 PRINT"IN ATTACK THEY USE THE":C$:PRINT
5520 F1=Z$(E):PROCMIDTACT
5530 PRINT"IN MIDFIELD THEY":C$:PRINT
5540 IF D4=0 THEN PROCCONTINUE:ENDPROC
5550 F1=Y$(E):PROCFREETACT
5560 PRINT"IN FREEKICKS AROUND THE BOX THEY USE A":PRINTC$
5570 F1=UX(E):PROCFREEDEF
5580 PRINT"AND DEFENDING AGAINST FREEKICKS THEY":PRINTC$:PRINT
5590 F1=VX(E):PROCCORNTACT
5600 PRINT"FROM A CORNER THEY":C$
5610 F1=W$(E):PROCCORNDEF
5620 PRINT"WHEN FACED WITH A CORNER THEY":PRINTC$:PRINT
5630 F1=F$(E):PROCFORM
5640 PRINT"THEY NORMALLY PLAY":C$:"FORMATION":PRINT

```

```

5650 PROCCONTINUE
5660 ENDPROC
5670 DEF PROCFORM
5680 IF F1=1 THEN C$=" A 4-3-3 "
5690 IF F1=2 THEN C$=" A 4-4-2 "
5700 IF F1=3 THEN C$=" A 4-2-4 "
5710 ENDPROC
5720 DEF PROCDEFTACT
5730 IF F1=1 THEN C$=" USE A SWEEPER "
5740 IF F1=2 THEN C$=" INTERCEPT PASSES "
5750 IF F1=3 THEN C$=" SHADOW ATTACKERS "
5760 ENDPROC
5770 DEF PROCATTACT
5780 IF F1=1 THEN C$=" FAST BREAK "
5790 IF F1=2 THEN C$=" EARLY CROSS "
5800 IF F1=3 THEN C$=" SLOW BUILD-UP "
5810 ENDPROC
5820 DEF PROCMIDTACT
5830 IF F1=1 THEN C$=" TACKLE HARD "
5840 IF F1=2 THEN C$=" MARK TIGHTLY "
5850 IF F1=3 THEN C$=" FIND SPACE "
5860 ENDPROC
5870 DEF PROCFREETACT
5880 IF F1=1 THEN C$=" DIRECT SHOT "
5890 IF F1=2 THEN C$=" CHIP TO THE FAR POST "
5900 IF F1=3 THEN C$=" TEE-UP FOR SHOT "

```



```
5910 ENDPROC
5920 DEF PROCFREEDEF
```



```
5930 IF F1=1 THEN C$=" MAKE A WALL "
5940 IF F1=2 THEN C$=" MARK MAN-TO-MAN "
5950 IF F1=3 THEN C$=" RUSH THE KICKER "
5960 ENDPROC
5970 DEF PROCCORNTACT
5980 IF F1=1 THEN C$=" PLAY IT SHORT "
5990 IF F1=2 THEN C$=" AIM FOR THE FAR POST "
6000 IF F1=3 THEN C$=" AIM FOR THE NEAR POST "
6010 ENDPROC
6020 DEF PROCCORDEF
6030 IF F1=1 THEN C$=" MOVE OUT FAST "
6040 IF F1=2 THEN C$=" RELY ON THE GOALKEEPER "
6050 IF F1=3 THEN C$=" USE CLOSE MARKING "
6060 ENDPROC
6070 DEF PROCZ
6080 INPUT "ENTER A NO. BETWEEN 1 & 3:"E$
6090 IF LEN(E$)>1 THEN 6140
6100 IF ASC(E$)<49 THEN 6140
6110 IF ASC(E$)>51 THEN 6140
6120 E$=VAL(E$)
6130 ENDPROC
6140 PRINT"PLEASE RE-ENTER"
6150 GOTO 6080
6160 ENDPROC
```

```
6170 DEF PROCOPNAME
6180 FOR I=1TO12
6190 Z9$(I)="NO."+STR$(I)
6200 NEXT I
6210 Z9$(1)="THEIR GOALKEEPER "
6220 ENDPROC
6230 DEF PROCBOL
6240 PRINT
6250 B4=B4+2.5:J$=Z1$+A2$(FNA(9)):PROCMOVEPRI
6260 PROCSCORE:PROCSUB
6270 IF I=K4 THEN ENDPROC
6280 PRINT"FROM THE KICK-OFF"
6290 ENDPROC
6300 DEF PROCSCORE
6310 J$="IT'S A GOAL! "+A$(Z1)+" HAVE SCORED":PROCMOVEPRI
6320 IF Z1=T THEN B=B+1
6330 IF Z1=Z THEN C=C+1
6340 D2=I*2
6350 IF RND(1)>.5 THEN D2=D2-1
6360 PRINT
6370 Z$=" MINUTES"
6380 IF D2=1 THEN Z$=" MINUTE"
6390 PRINT"SCORE AFTER ":D2:Z$
6400 PRINT:PRINT A$(T);" ";B;" ";A$(Z);" ";C
6410 Z2=1:ENDPROC
6420 DEF PROCRA
6430 G3=FNA(9):Z1$=Z1$+A1$(G3)
6440 IF Z8=T THEN H$=" "+K$(1+FNA(4))
6450 IF Z8=Z THEN H$=" "+Z9$(1+FNA(4))
6460 IF G3(4) THEN Z1$=Z1$+H$
6470 IF G3(4) THEN J$=Z1$:PROCMOVEPRI:Z2=1:ENDPROC
6480 IF Z8=T THEN H$=" "+K$(1)
6490 IF Z8=Z THEN H$=" "+Z9$(1)
6500 IF G3(6) THEN J$=Z1$+H$:PROCMOVEPRI:ENDPROC
6510 J$=Z1$:PROCMOVEPRI:ENDPROC
6520 DEF PROCSUB
6530 IF W1=1 THEN PROCCONTINUE:ENDPROC
6540 PRINT"PRESS 'S' TO BRING ON SUBSTITUTE":PRINT" ANY OTHER KEY TO CONT
INUE"
6550 Z$=GET$
6560 IF Z$="" THEN 6550
6570 IF ASC(Z$)<63 THEN ENDPROC
6580 CLS:W1=1
6590 W1=1
6600 FOR J=2TO11:PRINTJ;" ";K$(J):NEXT J
6610 PRINT"ENTER A NO. FROM 2 TO 11":PRINT"TO SHOW THE PLAYER TO BE SUBSTITUTE
D"
6620 INPUT K
6630 IF K(1) THEN 6620
6640 IF K(2) THEN 6620
6650 PRINT:J$=K$(K)+" TRUDGES OFF TO BE REPLACED BY "+K$(12):PROCMOVEPRI
6660 Z$=K$(K):K$(K)=K$(12):K$(12)=Z$
6670 W3=W3+(-(U1/10)+EX(K))*2
```

```

6680 ENDPROC
6690 DEF PROCPASTRES
6700 IF NX(E)=0 THEN ENDPROC
6710 PRINT:PRINT"RESULTS SO FAR":PRINT
6720 FOR I=1TONX(E)
6730 PRINTA*(E); " ";MX(E,I+7); " ";A*(MX(E,I)); " ";MX(E,I+14)
6740 NEXT I
6750 PRINT:PROCCONTINUE
6760 ENDPROC
6770 DEF PROCCSECSTAGE
6780 CLS:PRINT"GROUPS FOR THE 2ND. STAGE ARE :-":PRINT
6790 FOR I=1TO2
6800 PRINT"GP. ";CHR*(64+I);TAB(20);"GP. ";CHR*(66+I)
6810 PRINT
6820 FOR J=1TO3
6830 PRINTA*(HX(I,J));TAB(20);A*(HX(I+2,J))
6840 NEXT J
6850 PRINT
6860 NEXT I
6870 ENDPROC
6880 DEF PROCCSECFIXT
6890 W6=4:D1=27
6900 H2=1:A2=2:PROCCSECRETS
6910 H2=3:A2=1:PROCCSECRETS
6920 H2=2:A2=3:PROCCSECRETS
6930 ENDPROC
6940 DEF PROCCSECRETS
6950 PROCJ:PROCCPLAYCHECK
6960 CLS:PRINT"RESULTS FOR ";D1;" JUNE '82"
6970 PRINT
6980 FOR I=1TO4
6990 H=HX(I,H2):A=HX(I,A2)
7000 IF H=T THEN B=P2:C=P3:GOTO 7030
7010 IF T=A THEN B=P3:C=P2:GOTO 7030
7020 GOSUB 2820
7030 PRINT"GP. ";CHR*(I+64); " ";A*(H); " ";B; " ";A*(A); " ";C
7040 NEXT I
7050 IF D1=29 THEN PROCCONTINUE:PROCTABLE
7060 PRINT
7070 IF D1=29 THEN ENDPROC
7080 PRINT"PRESS 'L' TO SHOW LEAGUE TABLES":PRINT" ANY OTHER KEY TO CONT
NUE"

```



```

7090 Z$=GET$
7100 IF Z$="" THEN GOTO 7090
7110 IF Z$="L" THEN PROCTABLE
7120 D1=D1+1:ENDPROC
7130 DEFPROCJ
7140 FOR I=1TO4
7150 FOR J=1TO3
7160 DX(I,J)=HX(I,J)
7170 NEXT J:NEXT I
7180 ENDPROC
7190 DEF PROCCSEMI
7200 CLS:PRINT"SEMI-FINALS":PRINT"===="
7210 FOR I=1TO4
7220 PRINT
7230 NEXT I
7240 PRINTA*(SB(1));TAB(16);"V. ";A*(SB(3))
7250 FOR I=1TO4
7260 PRINT
7270 NEXT I
7280 PRINTA*(SB(2));TAB(16);"V. ";A*(SB(4))
7290 FOR I=1TO6
7300 PRINT
7310 NEXT I
7320 PROCCONTINUE
7330 ENDPROC
7340 DEF PROCCSEMIPLAY
7350 CLS:PRINT"BARCELONA 8th JULY 1982":PRINT
7360 PRINT"SEMI-FINAL":PRINT
7370 PRINTA*(SB(1)); " V. ";A*(SB(3))
7380 X3=1
7390 PROCWAIT
7400 X1=SB(1):X2=SB(3)

```

```

7410 PROCB
7420 CLS:PRINT"SEVILLE 8th JULY 1982":PRINT
7430 PRINT"SEMI-FINAL":PRINT
7440 E2=0:E1=0
7450 PRINTA$(S8(2));" V. ";A$(S8(4))
7460 PROCWAIT
7470 X1=S8(2):X2=S8(4)
7480 PROCB
7490 ENDPROC
7500 DEF PROCB
7510 FOR I=1TO90
7520 IF RND(1)>86/90 THEN PROCD
7530 IF I=45 THEN PROCE
7540 IF I/10=INT(I/10) THEN PROCF
7550 NEXT I
7560 IF E1=E2 THEN PROCG
7570 PRINT"FINAL SCORE"
7580 PRINTA$(X1);" ";E1;" ";A$(X2);" ";E2
7590 ENDPROC
7600 DEF PROCC
7610 W5=W5+1
7620 IF V=1 THEN ENDPROC
7630 IF E1>E2 THEN N1(W5)=X1
7640 IF E2>E1 THEN N1(W5)=X2
7650 ENDPROC
7660 DEF PROCD
7670 R7=RND(1)
7680 CLS:R9=RX(X1)/(RX(X1)+RX(X2))
7690 IF R7=R9 THEN 7670
7700 IF R7<R9 THEN J#=A$(X1)+" HAVE SCORED AFTER "+STR$(I)+" MINUTES"
7710 IF I=1 THEN J#=LEFT$(J#,LEN(J#)-1)
7720 IF R7<R9 THEN PROCMOVEPRI
7730 IF R7<R9 THEN E1=E1+1
7740 IF R7>R9 THEN J#=A$(X2)+" HAVE SCORED AFTER "+STR$(I)+" MINUTES"
7750 IF R7>R9 THEN PROCMOVEPRI
7760 IF R7>R9 THEN E2=E2+1
7770 PROCWAIT:ENDPROC
7780 DEF PROCE
7790 PRINT:PRINT"HALF TIME SCORE:"
7800 PRINT:PRINTA$(X1);" ";E1;" ";A$(X2);" ";E2:PRINT
7810 PROCWAIT:ENDPROC
7820 DEF PROCF
7830 CLS:PRINT"SCORE AFTER ";I;" MINUTES ":";"
7840 PRINTA$(X1);" ";E1;" ";A$(X2);" ";E2
7850 PROCWAIT:ENDPROC
7860 DEF PROCG
7870 CLS:PRINT"AFTER EXTRA TIME"
7880 R4=FNA(2)
7890 IF R4=1 THEN E1=E1+FNA(3)
7900 IF R4=2 THEN E2=E2+FNA(3)
7910 PROCWAIT:ENDPROC
7920 DEF PROCFINAL
7930 V=1:CLS:PRINT"MADRID 11th JULY 1982"
7940 FOR I=1TO6
7950 PRINT
7960 NEXT I
7970 PRINT"CUP FINAL":PRINT"==== ====="
7980 PRINTA$(N1(1));" V. ";A$(N1(2))
7990 PROCWAIT:PROCWAIT
8000 CLS:E1=0:E2=0:X1=N1(1):X2=N1(2)
8010 IF X1=T THEN Z=X2:PROCGAMEPLAY:E1=B:E2=C:GOTO 8040
8020 IF X2=T THEN Z=X1:PROCGAMEPLAY:E1=C:E2=B:GOTO 8040
8030 PROCB:PROCC:
8040 ENDPROC
8050 DEF PROCR
8060 IF X1=T THEN Z=X2:PROCGAMEPLAY:E1=B:E2=C:PROCC:GOTO 8090
8070 IF X2=T THEN Z=X1:PROCGAMEPLAY:E1=C:E2=B:PROCC:GOTO 8090
8080 PROCB:PROCC
8090 NX(X1)=NX(X1)+1
8100 MX(X1,6)=X2:MX(X1,13)=E1:MX(X1,20)=E2
8110 NX(X2)=NX(X2)+1
8120 MX(X2,6)=X1:MX(X2,13)=E2:MX(X2,20)=E1
8130 IF (X1-T)*(X2-T)()>0 THEN PROCCONTINUE
8140 ENDPROC

```

BOMBER

BY JANEK SIRRS

RUNS ON A BBC MODEL A IN 16K

Ace pilots only need apply for this little excursion into the wild blue yonder. Well, it's not really the flying you have to worry about. It's getting your undercarriage planted firmly back on the ground that's the problem.

You must try to land your ancient fighter plane in the middle of a city. To do this you must create a makeshift runway by bombing the skyscrapers. But you are running out of fuel — so your time is very limited.

```
10 REM *** BOMBER by J.Sirrs, 1982 ***
20 HISCOREX=0
30 MODE$=PROCinit:PROCTitle$=MODE4:PROCinst$=!&FE00=&10200A
40 PROCscreen
50 PXX=PXZ+1:IF ?FN$ (PXX+2,PYZ,NZ)=126THENPROCcrash:GOTO370
60 IFFXZ=40ANDPYZ<>2?THENPRINTTAB (PXX-1,PYZ):" " :!PXX=0:PYZ=PYZ+1
70 IFFXZ=37ANDPYZ=2?THENPROC1and:GOTO40
80 IFFXZ=0GOTO90 ELSEPRINTTAB (PXX-1,PYZ)" ";FLANE$;
90 IZ=INKEY (0):IF IZ>0ANDBOMBZ=0PROCcreatebomb
100 IFBOMBZ=1THENPROCmovebomb
110 PRINTTAB (11,1):SCOREX:FORLX=1TO400:NEXTLX:GOTO50
120 DEFPROCcreatebomb
130 BOMBZ=1:BXZ=PXX:BYZ=PYZ
140 ENDPROC
150 DEFPROCmovebomb
160 FORLX=1TO2:IFBYZ=PYZANDBXZ=PXXGOTO170 ELSEPRINTTAB (BXZ,BYZ):" "
170 BYZ=BYZ+1:IF ?FN$ (BXZ,BYZ,NZ)=126THENPROCexplosion:SCOREX=SCOREX+1:GOTO210

180 IFBYZ>29THENLX=3:BOMBZ=0:GOTO210
190 IFBOMBZ=0THENLX=3:GOTO210
200 PRINTTAB (BXZ,BYZ):CHR$ (227):SOUND1,-15,BYZ*2,1
210 NEXTLX:ENDPROC
220 DEFPROCexplosion
230 FOREX=0TORND (4):SOUND0,-15,4,1:IF IYX+EX>29THENEY=5:NEXTEX:LX=3:BOMBZ=0:END
PROC
240 PRINTTAB (BXZ,BYZ+EX):" ";NEXTEX
250 BOMBZ=0:LX=3:ENDPROC
260 DEFPROC1and
270 FORLX=1TO50:SOUND1,-15,LX,.05:NEXTLX
280 FORLX=1TO20:IFLX/2=INT (LX/2) THENCHX=228ELSECHX=229
290 PRINTTAB (35,29):CHX:CHX:FORDX=1TO750:NEXTDX:NEXTLX
300 PRINTTAB (12,12):"100 BONUS POINTS":FORLX=1TO5000:NEXTLX:PRINTTAB (12,12)"
";SCOREX=SCOREX+100
310 PRINTTAB (35,29):" ";CHR$ (30)
320 PYZ=29:FORPXX=8TO36:PRINTTAB (PXX-1,PYZ):" " :PYZ=PYZ-.2:PRINTTAB (PXX,PYZ)
!FLANE$:FORDX=1TO500:NEXTDX:NEXTPXX
330 SKX=SKX+1:PXX=1:PYZ=3:ENDPROC
340 DEFPROCcrash
350 FORLX=1TO20:VDU19,0,RND (15),0,0,0,19,1,RND (15),0,0,0:SOUND0,-15,RND (3)+3,1
!NEXTLX
360 VDU19,0,6,0,0,0,19,1,0,0,0,0:ENDPROC
370 CLS:VDU19,0,0,0,0,0,19,1,4,0,0,0
380 PRINT""""Oh dear you appear to have crashed you""
390 PRINT""plane!!!!""
400 PRINT""Your final score was :-";SCOREX;" points.""
410 IFSOREX>HISOREXTHENHISOREX=SCOREX:PRINT""Wow! You've just got the best
score yet.""
420 PRINT""Today's high score is :-";HISOREX:SCOREX=0:PXX=1:PYZ=3:BOMBZ=0
430 PRINT""TAB (8)"ANOTHER GAME (Y/N) ?""
440 AS=GET$:IFAS="Y"GOTO30ELSEGOTO450
450 MODE7:END
460 DEFPROCscreen
470 CLS:VDU19,0,4,0,0,0,19,1,7,0,0,0
480 PRINTTAB (5,1):"SCORE":SCOREX:TAB (20,1):"HI-SCORE":HISOREX
490 PRINTTAB (0,30):STRING$ (40,CHR$ (233)):CHR$ (30)
500 FORLX=3TO36:BHX=RND (3*SKX):PRINTTAB (LX,29):FORBX=1TOBHX:PRINTCHR$ (231):CH
R$ (1):CHR$ (8):SOUND1,-15,BX*3,1:NEXTBX:PRINTCHR$ (230):NEXTLX
510 PRINTTAB (PXX,PYZ)!FLANE$
520 ENDPROC
530 DEFPROCinit
```

```

540 VDU23,224,24,28,31,0,0,0,0,0
550 VDU23,225,63,5,255,255,15,2,7,7
560 VDU23,226,228,4,244,252,244,4,4,0
570 VDU23,227,126,60,24,60,60,60,60,24
580 VDU23,228,60,60,24,126,153,36,66,129
590 VDU23,229,189,189,153,126,24,36,66,129
600 VDU23,230,0,24,60,126,126,90,90,126
610 VDU23,231,126,90,90,126,126,90,90,126
620 VDU23,232,0,0,0,50,126,126,90,90,126
630 VDU23,233,255,255,255,255,255,255,255,255
640 PLANE$=CHR$(224)+CHR$(225)+CHR$(226)
650 SCOREX=0:PXZ=1:PYZ=3:BXZ=0:BYZ=0:BOMBX=0:NZ=4
660 DEF FNS(X,Y,N)=HIMEM+(Y*40+X)*8+N
670 ENDPROC
680 DEFPROCinst
690 CLS:VDU19,3,9,0,0,0:PRINTAB(5,14);"Do you need instructions (Y/N) ?"
700 A$=GET$:IFA$="Y"GOTO710 ELSEIFA$="N"GOTO 790 ELSEGOTO700
710 CLS:VDU19,1,3,0,0,0:COLOUR1:PRINTAB(13,1);"B O M B E R"
720 PRINT"" Try to land your ancient fighter plane"
730 PRINT"" by destroying all the city skyscrapers"
740 PRINT"" to create a makeshift runway!"
750 PRINT"" Bombs are dropped by pressing any key."
760PRINT"" WARNING - your fuel is limited!!"
770 PRINT"""" PRESS ANY KEY TO START YOUR FLIGHT"
780 A$=GET$
790 CLS:PRINTAB(5,12);"What is your skill level (1-3)?"
800 A$=GET$:SKZ=VAL(A$):IFSKZ>3ORSKZ<1GOTO790 ELSEENDPROC
810 DEFPROCtitle
820 CLS:VDU19,0,0,0,0,0,0,19,3,2,0,0,0
830 TL$="B O M B E R":FORLX=1TOLEN(TL$):COLOUR3:PRINTTAB(LX+3,10): " ":PLANE$:#
ORBX=1TOD4
840 COLOUR2:PRINTTAB(LX+5,11+8X);" ":CHR$(10):CHR$(8):CHR$(227):SOUND1,-15,B#Z
2,1:NEXTBX:COLOUR1:PRINTTAB(LX+5,16):MID$(TL$,LZ,1):SOUND0,-15,5,1:FORDX=1TOD100
:NEXTDX:NEXTLX
850 FORLX=1TOD12000:NEXTLX:ENDPROC

```

ALIEN ATTACK

BY R. PHELPS

RUNS ON A SHARP MZ80K

IN 16K

A vast fleet of alien craft is sweeping majestically toward your tiny space fighter — the only surviving defender of a race doomed to destruction. Doomed unless you can stop the attackers.

You have to knock out the alien battleships one by one while their mother ship dodges up and down the screen attempting to wipe you off the face of the universe.

Unfortunately for you this mothership is invulnerable. But the following fleet can be destroyed. You simply need to be a good marksman.

```

10 REM *****
11 REM *****
12 REM *****
13 REM *****
14 REM *****
15 REM *****
16 REM *****
17 REM *****
18 REM *****
19 REM *****
20 REM *****
21 REM *****
22 REM *****
23 REM *****
24 REM *****
25 REM *****
26 REM *****
27 REM *****
28 REM *****
29 REM *****
30 REM *****
31 REM *****
32 REM *****
33 REM *****
34 REM *****
35 REM *****
36 REM *****
37 REM *****
38 REM *****
39 REM *****
40 REM *****
41 REM *****
42 REM *****
43 REM *****
44 REM *****
45 REM *****
46 REM *****
47 REM *****
48 REM *****
49 REM *****
50 REM *****
51 REM *****
52 REM *****
53 REM *****
54 REM *****
55 REM *****
56 REM *****
57 REM *****
58 REM *****

```

S.O.S MISSION

BY NIGEL STUART

RUNS ON A 4000 SERIES PET

"Welcome captain. You are now in charge of the space fleet's newest most advanced battlecruiser. Your mission, should you accept it, is to pilot this craft into a tunnel on the enemy planet and destroy as many of their underground bases, ammunition and fuel dumps as possible . . ."

This is a version of arcade Scramble and all the rules of the video version apply. You gain extra fuel for your craft by bombing the fuel and ammunition dumps. Full instructions are included in the program.

To alter the program to run on a 3000 or 2000 series Pet the peek of find which key is being pressed must be changed. This is peek 151 and the value is held in variable Q. The movement of the tunnels is held in BS, CS, DS, ES, FS, and GS.

IN 16K

```

1 PRINT"J"
10 POKE59467,16:POKE59466,7
:P=59464:POKEP,0
11 DIMS$(10):DIMS(10)
15 FOR X=1 TO 10:S(X)=0:NEXTX
20 DIME(10)
30 E(1)=33230
31 E(2)=33189
32 E(3)=33145
34 E(4)=33150
35 E(5)=33179
36 E(7)=33303
37 E(6)=33262
38 E(8)=33197
39 E(9)=33233
40 E(10)=33151
90 A$="":B$="":C$="":D$="":E$="":
F$="":G$="":FORF=1TO200:NEXTF
91 K=0
95 GOSUB 6000
    
```

```

100 PRINT"#####S.O.S. MISSION"
110 PRINT"#####"
120 SH=33218: S3=33244: S5=0: S6=33204
130 PRINT"#####"
140 PRINT"##### FUEL | SCORE | AMO |"
150 PRINT"#####"
160 PRINT"#####"
170 PRINT"#####"
300 FU=999: SC=0: AM=30
800 A$="#####"
805 AA$="#####"
810 B$=B$+"#####"
815 B$=B$+"#####"
816 B$=B$+"#####"
820 C$=C$+"#####"
825 C$=C$+"#####"
827 C$=C$+"#####"
830 D$=D$+"#####"
835 D$=D$+"#####"
837 D$=D$+"#####"
840 E$=E$+"#####"
845 E$=E$+"#####"
847 E$=E$+"#####"
850 F$=F$+"#####"
855 F$=F$+"#####"
857 F$=F$+"#####"
860 G$=G$+"#####"
865 G$=G$+"#####"
867 G$=G$+"#####"
970 B$=A$+B$
971 C$=AA$+C$
972 D$=AA$+D$
973 E$=AA$+E$
974 F$=AA$+F$
975 G$=A$+G$
980 PRINT"#####"
981 PRINT"#####"
982 PRINT"#####"
983 PRINT"#####"
    
```

```

990 FOR ZX=1 TO LEN(B#)-42
991 IF S5=38 THEN GOSUB 2700
992 S9=S7:S7=S6-S8:IF S8=38 THEN GOSUB 2751
993 S4=S3-S5:S5=S5+2:S8=S8+2
994 LL=INT(RND(0)*3)-1:S7=S7+(LL*40)
995 POKES4,115:POKES4+1,246:POKES4+3,
32:POKES4+2,32
996 IF K<0 THEN POKES7,60:POKES7+1,92:
POKES7+2,32:POKES7+3,32
999 IF K<0 THEN POKES7,60:POKES7+1,92:
POKES7+2,32:POKES7+3,32

```

```

1000 B#=MID$(B#,2,LEN(B#))
1010 C#=MID$(C#,2,LEN(C#))
1020 D#=MID$(D#,2,LEN(D#))
1030 E#=MID$(E#,2,LEN(E#))
1040 F#=MID$(F#,2,LEN(F#))
1050 G#=MID$(G#,2,LEN(G#))
1110 PRINT"#####"
1120 PRINTMID$(B#,1,39)
1130 PRINTMID$(C#,1,39)
1140 PRINTMID$(D#,1,39)
1145 PRINT"###"
1150 PRINTMID$(E#,1,39)
1160 PRINTMID$(F#,1,39)
1170 PRINTMID$(G#,1,39)

```

```

1180 A1=PEEK(SH):A2=PEEK(SH+1):A3=PEEK(SH+2)
1300 POKESH,108:POKESH+1,111:POKESH+2,100:POKESH+3,32
1310 POKEP,210:POKEP,180:POKEP,230:POKEP,240:POKEP,0:S2=SH
1320 IF B>1 THEN SH=SH-1:B=B-1
1350 IF A1=102 OR A1=83 OR A1=65 OR A1=115 OR A1=246 THEN 3000
1360 IF A2=102 OR A2=83 OR A2=65 OR A2=115 OR A2=246 THEN 3000
1370 IF A3=102 OR A3=83 OR A3=65 OR A3=115 OR A3=246 THEN 3000
1380 IF A1=86 OR A2=86 OR A3=86 THEN 3000
1390 IF A1=60 OR A2=60 OR A3=60 THEN 3000
1400 PRINT"#####"
1410 PRINT"#####"FU
1420 PRINT"#####"AM
1430 PRINT"#####"SC

```

```

1440 POKEE(INT(RND(0)*10)+1),86
1450 POKEE(INT(RND(0)*10)+1),32
1460 POKES9,32:POKES9+1,32
1500 Q=PEEK(151)
1510 IF Q=50 THEN SH=SH-40:GOSUB2100
1520 IF Q=18 THEN SH=SH+40:GOSUB2100
1530 IF Q=41 THEN SH=SH+2:GOSUB2100:B=B+2
1540 IF B>22 THEN B=B-1:SH=SH-1
1550 IF Q=48 THEN PP=0:GOSUB2300
1560 IF Q=32 THEN PP=0:GOSUB2400

```

```

1600 FU=FU-5
1610 IF FUC<5 THEN 3000
1999 SC=SC+1
2000 NEXTZX
2005 A$="" :AA$=""
2006 K=K+1
2010 GOT0810

```

```

2100 POKES2,32:POKES2+1,32:POKES2+2,32:POKES2+3,32
2110 A1=PEEK(SH):A2=PEEK(SH+1):A3=PEEK(SH+2)
2210 POKESH,108:POKESH+1,111:POKESH+2,100

```

```

2220 RETURN
2300 IF AM<1 THEN RETURN
2301 AM=AM-1
2305 FOR Z=S2+4 TO S2+10
2310 IF PEEK(Z)=102 THEN PP=1:GOT02390
2311 IF PEEK(Z)=83 THEN 2900
2312 IF PEEK(Z)=65 THEN 2900
2313 IF PEEK(Z)=115 THEN 4000
2314 IF PEEK(Z)=129 THEN 3300
2315 IF PEEK(Z)=134 THEN 3400
2316 IF PP=1 THEN 2390
2320 POKEZ,46:POKEP,140:POKEP,142
2330 POKEP,46:POKEP,190:POKEP,200
2340 POKEP,0:POKEZ,32
2390 NEXTZ:RETURN
2400 AM=AM-1:IF AM<0 THEN RETURN

```

```

2410 Z=SH+3
2420 Z=Z+40
2421 IF PEEK(Z)=102 THEN 2500
2422 IF PEEK(Z)=83 THEN 2800
2423 IF PEEK(Z)=65 THEN 2900
2424 IF PEEK(Z)=115 THEN 4000
2425 IF PEEK(Z)=129 THEN 3300
2426 IF PEEK(Z)=134 THEN 3400
2430 POKEZ,81:POKEP,100
2435 FORZZ=1T04:POKEP,200:POKEP,180:POKEP,110:NEXTZZ

```



```
2440 POKEP,0:FORZZ=1TO20:NEXTZZ:POKEZ,32
2490 GOTO 2420
2500 RETURN
2700 POKES4,32:POKES4+1,32:POKES4+2,32:POKES4+3,32:POKES4+4,32
2710 S5=0:L=INT(RND(0)*3)
2720 S3=33164+(L*40)
2750 RETURN
2751 S8=0:L=INT(RND(0)*3)
2752 S6=33164+(L*40)
2753 POKES9,32:POKES9+1,32:POKES9+2,32:POKES9+3,32:POKES9+4,32
2755 RETURN
2800 FOR F=1 TO 25
2810 J=INT(RND(0)*4)
2820 POKEP,J*25:IF J=1 THEN POKEZ,86
```

```
2830 IF J=2 THEN POKEZ,214
2840 IF J=3 THEN POKEZ,32
2850 POKEP,J+20
2860 NEXTF:POKEP,0:SC=SC+1000:RETURN
2900 FOR X=1 TO 25
2910 J=INT(RND(0)*4)+1
2920 POKEP,J*10:IF J=1 THEN POKEZ,87
2930 IF J=2 THEN POKEZ,215
2940 IF J=3 THEN POKEZ,32
2950 POKEP,J*20+50:NEXTX:POKEP,0:SC=SC+500:RETURN
3000 POKES2+3,32
3005 FOR Z=1 TO 10
3010 POKEP,210:POKES2,32:POKES2+1,32:POKES2+2,160:POKEP,0
3015 POKEP,170:POKES2,32:POKES2+1,32:POKES2+2,102:POKEP,0
3020 POKEP,180:POKES2,32:POKES2+1,160:POKES2+2,32:POKEP,0
3025 POKEP,250:POKES2,32:POKES2+1,102:POKES2+2,32:POKEP,0
3030 POKEP,240:POKES2,160:POKES2+1,32:POKES2+2,32:POKEP,0
3035 POKEP,125:POKES2,102:POKES2+1,32:POKES2+2,32:POKEP,0
```

```
3040 NEXTZ
3050 POKES2,32:POKES2+1,32:POKES2+2,32
3100 FOR X=32768TO33767STEP4
3110 Z=PEEK(X)
3120 IF Z<128 THENZ=Z+128:GOTO3140
3130 IF Z>128 THENZ=Z-128
3140 POKEP,Z:NEXTX
3250 FORF=1TO800:NEXTF:PRINT"Q"
3260 GOTO 4500
3300 FOR X=1 TO 50
3310 J=INT(RND(0)*4)
3320 IF J=1 THEN POKEZ,1:POKEP,210:POKEP,180
3330 IF J=3 THEN POKEZ,129:POKEP,170:POKEP,240
3340 NEXTX
3350 AM=AM+10
3390 RETURN
3400 FOR X=1 TO 50
3410 J=INT(RND(0)*4)
3420 IF J=1 THEN POKEZ,134:POKEP,150:POKEP,110
3430 IF J=3 THEN POKEZ,6:POKEP,110:POKEP,190
```

```
3440 NEXTX
3450 FU=FU+100:RETURN
4000 EDPZ=1 TO 10
4005 POKEZ,INT(RND(0)*250):POKEZ+1,32
4010 J=INT(RND(0)*4)
4020 POKEP,J*20:IF J=1 THENPOKEZ-41,43
4030 IF J=2 THENPOKEZ-41,171
4040 IF J=3 THENPOKEZ-41,32
4060 POKEP,J*25:IF J=1 THENPOKEZ-39,43
4070 IF J=2 THENPOKEZ-39,171
4080 IF J=3 THENPOKEZ-39,32
4100 POKEP,J*15:IF J=1 THENPOKEZ+39,43
```

```

4110 IFJ=2THENPOKEZ+39,171
4120 IFJ=3THENPOKEZ+39,32
4140 POKEP,J*10:IFJ=1THENPOKEZ+41,43
4150 IFJ=2THENPOKEZ+41,171
4160 IFJ=3THENPOKEZ+41,32
4170 NEXTX:POKEP,0
4180 POKEZ-39,32:POKEZ-41,32:POKEZ+41,32:POKEZ+39,32:POKEZ,32
4190 S5=0:L=INT(RND(0)*3)
4200 S3=33164+(L*40):SC=SC+250
4210 RETURN
4500 REM ***** END *****
4501 GETN$:PRINT"N$":IF N$<>" " THEN 4501
4510 PRINT""
4520 PRINT"*****GAME OVER"
4530 PRINT"*****"
4540 PRINT"*****YOU SCORED "SC
4550 FORX=1TO10:IFSC>S(X)THEN4570
4560 NEXTX:GOTO4700
4570 PRINT"*****PLEASE ENTER YOUR NAME FOR THE "
4580 PRINT"*****SCORE-TABLE."
4590 PRINT""
4600 INPUTS$(X):S(X)=SC
4610 IF LEN(S$(X))>12 THEN 4570
4700 FOR F=1 TO 800:NEXTF:PRINT""
4710 PRINT"*****YOU JUST SCORED"SC
4720 PRINT""

```

```

4730 FORX=1TO10
4740 PRINT"*****"S(X)" "S$(X)
4750 POKEP,X*20
4760 FOR Z=1 TO 80:NEXTZ
4800 NEXTX
4805 POKEP,0
4810 PRINT"*****KPRESS RETURN)"
4820 IF PEEK(151)<>27 THEN 4820
4900 GOTO90
5000 END
6000 REM ***** START *****
6001 GETN$
6005 GOTO 7010
6010 RESTORE:PRINT":POKE59458,100
6015 PRINT"*****"
6020 READZ$:READZ2:POKEP,Z2
6025 GETN$:IFN$<>" " THEN 7500
6030 IF Z$="+" THEN 6980
6050 PRINTZ$
6060 PRINT
6100 FOR X=1 TO 20:POKEP,Z2:POKEP,Z2+10:NEXTX
6110 FOR X=1 TO 10:POKEP,Z2+10:POKEP,Z2-10:NEXTX
6120 POKEP,0:FORX=1TO500:NEXTX
6200 GOTO 6020
6980 POKEP,0:POKE59458,30
6990 POKE59458,30
7000 GOTO6000
7010 PRINT":POKE59458,100 FORZ=1TO250:NEXTZ
7015 FOR X=1 TO 24
7017 GETN$:IFN$<>" " THEN 7500
7020 PRINTTAB(10)"S.O.S. MISSION "
7030 FOR Z=1 TO 100 STEP11:POKEP,Z:NEXTZ:POKEP,0
7040 FOR Z=1 TO 40:NEXTZ
7050 PRINTTAB(10)" S.O.S. MISSION"
7060 FOR Z=100 TO 1 STEP-11:POKEP,Z:NEXTZ:POKEP,0

```

```

7070 FOR Z=1 TO 40:NEXTZ
7100 PRINTTAB(11)" S.O.S. MISSION 7"
7110 FOR Z=10 TO 200 STEP-14:POKEP,Z:NEXTZ:POKEP,0
7120 FOR Z=1 TO 60:NEXTZ
7125 GETN$:IFN#<" THEN 7500
7150 PRINTTAB(11)" S.O.S. MISSION 7"
7160 FOR Z=10 TO 200 STEP-14:POKEP,Z:NEXTZ:POKEP,0
7170 FOR Z=1 TO 40:NEXTZ
7180 PRINTTAB(10)" S.O.S. MISSION 7"
7190 FOR Z=100 TO 1 STEP-11:POKEP,Z:NEXTZ:POKEP,0
7200 FOR Z=1 TO 40:NEXTZ
7210 PRINTTAB(10)"S.O.S. MISSION 7"
7220 FOR Z=1 TO 100 STEP11:POKEP,Z:NEXTZ:POKEP,0
7230 FOR Z=1 TO 40:NEXTZ
7240 PRINTTAB(10)"
7300 NEXTX
7400 GOTO 6010
7500 POKES9458,30:PRINT"XXXXXXXXXXXXXXXXXXXXXXXXXKPRESS SPACE"POKEP,0
7510 GET N$:IF N#<" THEN 7510
7520 PRINT">":RETURN
9000 DATA" S.O.S. MISSION.",210
9010 DATA" .190
9015 DATA" (C) BY NIGEL STUART 29:8:1982.",190
9020 DATA" ,170
9030 DATA" WELCOME CAPTAIN YOU ARE NOW PLACED",150
9040 DATA" IN CHARGE OF OUR LATEST SPACE-CRAFT.",180
9050 DATA" YOUR MISSION IS TO ENTER A TUNNEL",220
9060 DATA" ON AN ALIEN PLANET AND DESTROY",150
9090 DATA" AS MANY OF THERE UNDERGROUND",130
9100 DATA" BASES, AMO DUMPS AND FUEL DUMPS ",240
9110 DATA" AS YOU CAN BEFORE YOU RUN OUT OF FUEL.",240
9120 DATA" ,100
9130 DATA" YOU MAY GAIN EXTRA FUEL AND AMO BY",190
9140 DATA" BOMBING OR SHOOTING AMO AND FUEL DUMPS.",210
9150 DATA" THESE ARE SHOWN AS *A* AND *F*.",80
9160 DATA" ,50
9170 DATA" THE CONTROLS FOR THE SPACE-CRAFT",80
9180 DATA" ARE AS FOLLOWS :=",170
9190 DATA" ,200
9200 DATA" 8 TO MOVE UP.",230
9210 DATA" 2 TO MOVE DOWN.",210
9220 DATA" 6 TO MOVE FORWARD.",190
9230 DATA" ,170
9240 DATA" A TO FIRE FORWARD.",150
9250 DATA" Z TO DROP A BOMB.",110
9260 DATA" ,150
9270 DATA" -----",180
9280 DATA" POINTS AWARDED FOR HITTING ",200
9290 DATA" * = 500",90
9300 DATA" * = 1000",80
9310 DATA" +* = 250",90
9320 DATA" YOU CAN NOT HIT <",80
9330 DATA" *A* = 10 UNITS OF AMO",90
9340 DATA" *F* = 100 UNITS OF FUEL",80
9350 DATA" -----",180
9360 DATA" ,150
9370 DATA" GOOD LUCK!! ",200
9380 DATA" YOU WILLNOT BE ABLE TO RETURN BECAUSE",190
9390 DATA" YOU WILL BE BLOWN UP.",210
9400 DATA" BUT TRY TO GET AS FAR AS YOU CAN.",220
9410 DATA" WE ARE COUNTING ON YOU.....",230
9420 DATA" ,240
9430 DATA" ,210
9440 DATA" ,180
9450 DATA" ,150
9460 DATA" ,110
9470 DATA" ,80
9480 DATA" ,50
9490 DATA" ,20
9500 DATA" ,245
9510 DATA" ,245
9520 DATA" ,245
9530 DATA" ,10
9999 DATA" +",0

```

COPY

```

1REN BY neil devlin SEPT1982
2P.#12:7#E1=0;7#G00=32.P. ....
3P. .... BY .... NEIL DEVLIN
4F.D=1T090;WRIT.N.
5P.#12:7#G00=32
67#E1=0.P. .... ** COPY **
77#E1=0.P. .... ** REPEAT WHAT THE COMPUTER FLASHES **
87#E1=0.P. .... ** BY PRESSING NUMBERS 1 TO 4. **
9IN. .... INPUT ... I-FAST SLOW-2 *0
10IF (C1) (C2) G.3
11IF C=1 V=18;G.13
120=28
1301MB947
14J=0;M=8000
15 P.#21;DIR R#1,P=1;L=FF#E3
16C. .... JSR L;STR#0;RTS;J.P.#6
177#E1=C#E=0;I=0
18F.D=0T047
19#A,R;N;I;F#0=0;G.19
20800=R;N.
21CLEARR4
22GOS.C;COLOUR3
23GOS.50;F.D=1T020;WRIT.N.
24GOS.45
25E=C#I;B#0;C#0
26GOS.39
27IF#G GOS.B;GOS.A;G#G+1;E#0;C#0;F#0;F.D=1T065;WRIT.N;G.24
28F#F+1;C#0;G.24
29E.
30ALINK R#0
31IF(7#G0)52;(7#G0)49;G.#
32IF7#G0=49 I=1+1;J=1;X=10;COLOUR1
33IF7#G0=50 I=1+1;J=2;X=48;COLOUR1
34IF7#G0=51 I=1+1;J=3;X=78;COLOUR3
35IF7#G0=52 I=1+1;J=4;X=100;COLOUR3
36B#C#0;GOS.39;IFB#1-1;X;J;G.6
37IF#E1 I=0;F#0;COLOUR0;GOS.58;P.
38G.#
39REM DRAW SQUARE
40F.D=1T03
41MOVE(X#B);75;WRIT;DRAW(X#B);88

```

```

42B#0+1;N.1;F C=1;GOS.55
43F.D=1T0;WRIT.N.
44IFC#0;COLOUR0;B#0;C=1;G.39;R.
45IF B#E=2 X=10;COLOUR1;R.
46IF B#E=2 X=48;COLOUR1;R.
47IF B#E=3 X=78;COLOUR3;R.
48IF B#E=4 X=100;COLOUR3;R.
49E.
50REM DRAW NUMBERS
51MOVE11.60;DRAW11.65
52MOVE42.60;DRAW42.65;DRAW39.62;DRAW42.62;DRAW42.64;DRAW43.64
53MOVE78.60;DRAW78.60;DRAW73.64;DRAW78.64;DRAW78.62;DRAW73.62
54MOVE103.62;DRAW100.62;DRAW100.64;MOVE102.63;DRAW102.60;R.
55P.#7;R.
56REM DRAW 'YOUR GO'
57COLOUR4
58MOVE35.150;DRAW39.150;DRAW39.150;MOVE39.154;DRAW35.154
59DRAW35.150
60MOVE43.150;DRAW47.150;DRAW47.150;DRAW43.150;DRAW43.150
61MOVE51.150;DRAW51.150;DRAW55.150;DRAW55.150
62MOVE59.150;DRAW59.150;DRAW62.150;DRAW63.157;DRAW63.154
63MOVE63.154;DRAW59.154;MOVE61.154;DRAW63.150
64MOVE78.150;DRAW78.151;DRAW74.157;DRAW74.151;DRAW75.150
65DRAW77.150;DRAW78.151;DRAW78.153;DRAW77.153
66MOVE82.150;DRAW86.150;DRAW86.150;DRAW82.150;DRAW82.150
67R.
68P.#12:7#E1=0;7#G00=32
69P. .... TUT-TUT ... WRONG CHOICE *
70IN. .... ANOTHER GAME (1-NO YES-2)*2
71F Z=2;G.74
72P.#12:7#E1=0;7#G00=32.P. .... BYE-COMPA *
73G.73
74P.#12:7#E1=0.P. .... *O.K I'LL GIVE YOU ANOTHER CHANCE *
757#G00=32;G.9
76REM DRAW 'COPY'
77COLOUR3
78MOVE56.190;DRAW54.190;DRAW54.190;DRAW56.190
79MOVE58.190;DRAW58.190;DRAW58.190;DRAW58.190;DRAW58.190
80MOVE62.190;DRAW64.190;DRAW64.190;DRAW62.190;DRAW62.190
81MOVE66.190;DRAW66.190;DRAW66.190;MOVE68.190;DRAW68.190
82DRAW66.190;R.

```

How good are your powers of concentration and memory?
Not very good, then let Copy hone them to razor sharpness as the Atom displays in hi-res graphics an ever increasing sequence

of numbers for you to remember. One wrong one and you have to start all over again from scratch.
For those of you thinking you are superior there is a fast mode designed to take the smirk off your face and bring you back to reality.
Based upon the Simon game, Copy is written for an expanded Atom.

COPY BY NEIL DEVLIN RUNS ON AN ATOM IN 12K

```

10 GO SUB 620
15 REM MAIN LOOP
30 FOR g=1 TO 20
30 IF g>1 THEN PRINT AT 11,4;
PAPER 3; FLASH 1; " Mode 1:1 : g;
9ghosts now " : PAUSE 300; FOR j
5E TO 5: DEEP ",,30: NEXT j: PAU
5E 200
40 LET a=0
50 GO SUB 620
55 REM SET UP ANTI-MATTER
60 FOR j=1 TO 10
70 PRINT AT INT (RND*20)+1,INT
(RND*30)+1; INK 5;" *
80 NEXT j
85 REM SET UP PLAYER & GHOSTS
90 LET a=INT (RND*21)+1
100 LET b=INT (RND*31)+1
110 DIM a(g,2); DIM b(g,2)
120 FOR j=1 TO g
130 LET a(j,1)=INT (RND*21)+1
140 LET a(j,2)=INT (RND*31)+1
150 NEXT j
160 LET c=a; LET d=b
170 GO SUB 420
180 PRINT AT 0,0; PAPER 2;" "
190 PAUSE 0
195 REM MOVEMENT LOOP
200 FOR k=1 TO 3
210 LET c=a
220 LET d=b
225 REM PLAYER MOVEMENT
230 LET a=a+(INKEY$="6" AND a<2
1)-(INKEY$="7" AND a>1)
240 LET b=b+(INKEY$="8" AND b<3
1)-(INKEY$="5" AND b>0)
245 REM GHOST MOVEMENT

```

GHOSTS

How long can you evade the nasty little ghosts that pursue relentlessly around the screen? Your only chance is to force the ghosts to step onto anti-matter spots.

First there will be one ghost after you and when he has been disposed of two more will appear to carry on the evil job. When the two have gone three will appear, then four, five...

Watch out that you do not get caught by them or step onto an anti-matter spot or you will come to a nasty end!

This program uses all three of the best requisites - sound, colour, and user-defined graphics - to make up an exciting arcade type game.

When run the computer sets up the screen and waits for you to press a key before starting. Your little man is moved by the cursor keys.

BY IAN McATAMNEY

RUNS ON A SPECTRUM IN 16K

```

250 FOR J=1 TO 9
260 IF J=9 THEN GO TO 370
270 IF #=9 THEN NEXT J
280 IF a(J,1)=200 THEN NEXT J
290 IF J>9 THEN GO TO 370
300 LET b(J,1)=a(J,1):LET b(J,
2) = a(J,2)
310 IF #=3 THEN GO TO 340
320 LET a(J,1)=a(J,1)+a(J,2):c
320 LET a(J,2)=a(J,2)+a(J,2):b
330 LET a(J,2)=a(J,2)+a(J,2):b
340 LET a(J,2)=a(J,2)+a(J,2):b
350 PRINT AT b(J,1),b(J,2):"
THEEP .055: LET a(J,1)=200: LET
#=#+1
360 IF a(J,1)=a AND a(J,2)=b TH
EN GO TO 580
370 NEXT J
380 IF #=9 THEN NEXT J
390 IF ATTR (a,b)=13 THEN GO TO
540
400 GO SUB 420
410 NEXT K
420 GO TO 200
430 REM PRINT SCREEN
440 PRINT AT c,d:":AT a,b:":#
450 BEEP 2,20:PAPER 2:
460 PRINT AT 0,0:PAPER 2:
470 Ghosts left:":#-a:

```

```

450 FOR J=1 TO 9 THEN NEXT J
460 IF a(J,1)=200 THEN NEXT J
470 IF #=9 THEN RETURN
480 IF ATTR ((a(J,1),a(J,2)))
=14 THEN LET
a(J,2)=b(J,2)
490 PRINT AT b(J,1),b(J,2):":
AT a(J,1),a(J,2): INK 6:

```

```

500 NEXT J
510 RETURN
520 PAPER 1: INK 7: CLS : BORDE
R 0
530 RETURN
535 REM END GAME
540 PRINT AT c,d:":AT a,b: FL
ASH 1: INK 2:":0,0: PAPER 4: INK
550 PRINT AT " Fool, you went onto
FLASH 1:":
560 FLASH 1:":
570 BEEP 2,45
580 PAUSE 0: PAUSE 0: RUN
590 PRINT AT b(J,1),b(J,2):":
AT c,d: INK 2:":0,0: PAPER 4: INK
590 PRINT AT " Got you this t
FLASH 1:":
600 BEEP 2,45
610 PAUSE 0: PAUSE 0: RUN
620 REM USER-DEFINED GRAPHICS
630 FOR J=0 TO 7: READ P: POKE
USR "a"+J,VAL ("BIN "+STR$ P): N
EXT J
640 FOR J=0 TO 7: READ P: POKE
USR "b"+J,VAL ("BIN "+STR$ P): N
EXT J
650 FOR J=0 TO 7: READ P: POKE
USR "c"+J,VAL ("BIN "+STR$ P): N
EXT J
660 RETURN
660 DATA 10000,11000,10000,111
1100,10000,10000,10100,1000100,
11100,1111100,101100,1101010,
1111110,1111110,1011010,10010
110,111100,111110,111111,1111
110,111100,111111,111111,111110,1
1100

```

```

1 PRINT#8:
2 DATA$3249,53413,53536,53618
10 DATA$3268,53424,53541,53619
20 DIM CL(2,4):FOR I=1 TO 2:FOR J=1 TO 4:READ CL(I,J)
: NEXT J, I
25 DATA 20,12,6,2
30 FOR I=1 TO 200:TV=RND(1)+NEXT
35 LI=6+INT(RND(1)+5):FL=6+INT(RND(1)+5):DR
=INT(RND(1)+4):CI=L:LI+LI-1
40 DIM M(4):FOR I=1 TO 4:READ M(I):NEXT
50 DIM DL(2,4):DL(1,1)=1:DL(1,2)=1:DL(2,1)=
1:DL(2,2)=1:V
55 DIM UL(2):UL(1)=6:UL(2)=1:3
60 DIM DR(4):FOR I=1 TO 4:READ DR(I):NEXT
65 DATA 2,3,5,7
71 DATA 14,15,42,14,10,10,2,6,14,6
72 DATA 14,15,21,70,10,15,21,21,21
73 DATA 21,21,14,5,10,10,2,15,21,21
74 DATA 7,3,35,10,10,6,35,10,15,21
75 DATA 21,35,10,10,6,21,14,10,10,15
76 DATA 105,14,10,10,15,105,35,10,10,6
77 DATA 70,5,10,10,10,2,10,2,10,15
78 DATA 14,10,10,10,10,3,42,7,10,30
79 DATA 35,10,2,6,70,15,21,21,70,6
80 DATA 70,10,15,35,10,10,5,5,10,15
81 DATA 42,14,10,2,10,15,14,10,10,6
82 DATA 21,35,30,21,14,10,5,10,6,21
83 DATA 35,10,6,21,21,14,10,5,21,21
84 DATA 14,6,21,21,21,35,6,21,21,21
85 DATA 21,105,21,21,35,10,15,21,21,21
86 DATA 35,10,3,35,10,10,10,15,105,21
87 DATA 14,10,5,6,14,6,14,10,10,15
88 DATA 21,14,6,105,21,21,35,10,10,6
89 DATA 21,21,7,10,15,21,14,10,30,21
90 DATA 35,15,35,10,10,5,5,10,10,15
91 DATA 14,10,10,6,21,14,2,10,6,42
92 DATA 21,14,6,21,35,15,21,42,21,21
93 DATA 21,42,21,21,14,2,15,21,35,15
94 DATA 7,2,3,21,21,21,14,3,14,6
95 DATA 21,21,105,21,21,21,21,35,15,21
96 DATA 21,35,10,15,21,35,5,10,10,3
97 DATA 35,10,10,10,5,10,2,10,6,21
98 DATA 42,70,10,2,10,6,21,42,35,15
99 DATA 7,21,2,3,14,5,5,5,10,10,6
100 DATA 105,70,15,105,35,10,10,30,70,15
101 REM == INSTRUCTIONS ==
110 PRINT#
111 PRINT#
112 PRINT# 3 - D
113 PRINT#

```

3D MAZE

BY MATTHEW BLAKSTAD

RUNS ON AN MZ80K IN 7K

Baffled, bothered and bewildered? No? Well you will be after trying to find your way out of 3D-Mazel

You'll find yourself in an impressive graphic representation of a mindbending maze once you've programmed in all the twists and turns. All you have to do is escape.

The program enables you to move left, right, and forwards, and even to execute a neat little 180 degree "flip" as you attempt to work out which way the exit is.

When the elusive exit is in sight a letter 'E' appears on the screen. A musical jingle greets your successful escape and the computer displays the time it took you to get out of its mysterious maze. See you soon - we Variables/arrays

CL(2,4): corner location on screen of walls. TV: temporary variable. LI, LJ: co-ordinates of player. TI, TJ: temporary co-ordinates for

printout. SI, SJ: co-ordinate for finding side location. DR: direction in which player is facing. CI, CJ: co-ordinates for printout at end of game. DW, (4): depth of wall for each distance. DL (2,2): codes of diagonal line graphics. VL (2): codes of vertical line graphics.

DR (4): prime number for testing the presence of a wall. S: horizontal space string. I&J: loop variables. (also X). AS: temporary string variable. M5 (10,10): number of each cell for testing for the presence of a wall. MZ: choice of maze. TT\$: MZ-80K time string. CA: advancement of cell from (TI,TJ). SD: side being tested for a wall.

OV: other temporary variable. TN: direction of turn/correct input test. PP: position of poke (location). CI: left hand corner for facing wall. C2: right hand corner for facing wall. WH: wall height for facing wall. DW: wall depths for walls in adjacent cells.

```

134 PRINT "
135 PRINT "
136 PRINT "
137 PRINT "
138 PRINT "
139 PRINT "
140 PRINT "
141 PRINT "
142 PRINT "
143 PRINT "
144 PRINT "
145 PRINT "
146 PRINT "
147 PRINT "
148 PRINT "
149 PRINT "
150 TEMP07:FOR J=1 TO 5:FOR I=1 TO 5:MUSIC"LDLE0"
151 NEXT I:FOR I=1 TO 5:MUSIC"LDLE0"
155 NEXT I:J
160 PRINT "0":PRINTS#:"Find your way"
161 PRINTS#:"through a"
162 PRINTS#:"neerscape view"
163 PRINTS#:"of one of three"
164 PRINTS#:"mazes.usins the"
165 PRINTS#:"comands listed."
166 PRINT:PRINT:PRINTS#:"N.B. The cell"
167 PRINTS#:"nearest to you"
168 PRINTS#:"is the one"
169 PRINTS#:"which you are"
170 PRINTS#:"in."
180 PRINT:PRINT:PRINT:PRINTS#:"PRESS ANY KEY"
190 GET A#:IFA#=""THEN190
250 PRINT"SELECT MAZE (1-3)"
260 GETA#:IF VAL(A#)=0+(VAL(A#))3)THEN260
265 PRINT"0"
270 DIMS(10,10):FORO=1 TOVAL(A#):FORI=1 TO10:
FORJ=1 TO10:READMS(1,J):NEXTJ,I:X
280 MZ=VAL(A#)
290 POKES955,0
295 TI#="000000"
299 REM == DISPLAY LOOP ==
300 TI=LJ:TJ=LJ:FORCA=1 TO4
309 REM == LEFT & RIGHT WALLS ==
310 FORSD=1 TO2
320 OU=DR+(3-2*SD):IFOU=0 THENOU=4
325 IFOU=5 THENOU=0
330 TU=MS(TI,TJ):DR(OU)
335 IFINT(TU)>TUTHEN1050
340 FORI=CL(SD,CA):TOCL(SD,CA)+(4-
CA)STEP(43-2*SD)
345 POKEI,DL(SD,1):NEXT
347 IFCR=4 THENI=CL(SD,CA)+40:GOTO360
350 TU=1+(SD+2-3):FORI=TUTOTU+40*(DM(CA)-2+
(4-CA)-3)STEP40:POKEI,UL(SD):NEXT
360 TU=1:FORI=TUTOTU+(37+2*SD)+(4-CA)STEP
(37+2*SD):POKEI,DL(SD,2):NEXTI
370 FORI=CL(SD,CA)+(2*SD-3):TOCL(SD,CA)+
(2*SD-3)+40*(DM(CA)-40)STEP40
380 POKEI,UL(SD):NEXTI
381 NEXTSD
385 IFCR=4 THENH450
390 TUMS(TI,TJ):DR(DR)
400 IFINT(TU)=TUTHEN1000
410 IFDR=1 THENI=TI-1:IFTI=0 THENPOKEL
(1,4):5:GOTO700
420 IFDR=2 THENJ=TJ+1
430 IFDR=3 THENI=TI+1
440 IFDR=4 THENJ=TJ-1
450 NEXTCA
700 POKES955,1:PRINT"0":S#:" Your move"
710 PRINTS#:"
720 PRINT:PRINT:PRINTS#:"L=Left R=Right"
730 PRINT:PRINTS#:"F=Flip M=Move"
740 PRINT:PRINT:PRINTS#:""
750 GETA#:IFA#=""THEN750
760 PRINT"0":S#:" :I#
770 IFA#="L" THENTH=1
780 IFA#="R" THENTH=-1
790 IFA#="F" THENTH=2
800 IFA#="M" THENH50
810 IFTH=0 THEN750
820 DR=DR+TH:IFDR=0 THENDR=4
830 IFDR=4 THENDR=-4
840 TH=0:PRINT"0":POKE9555,0:GOTO300
850 IFMS(LI,LJ)/DR(DR)=INT(MS(LI,LJ)/DR(DR
) THENMUSIC"0":GOTO750
855 IFDR=1 THENLI=LJ-1:IFLI=0 THEN900
860 IFDR=2 THENLJ=LJ+1

```

```

870 IFDR=3 THENLI=LJ+1
880 IFDR=4 THENLJ=LJ-1
890 GOTO940
900 FORI=1 TO200:POKE4514,INT(RND(1)*50):USR
(68):NEXT IUSR(71)
910 PRINT"0"
920 ONMZGOSUB1100,1400,1620
930 PRINT"0000000000":S#:"STARTING"
935 PRINTS#:"CO-ORDS 1-"
940 PRINT:PRINTS#:"(:"C1:" ,":CJ:" )"
945 FP=53207*80+C1+2*CJ
950 POKEFP,202
955 PRINT:PRINT:PRINTS#:"Time=":VAL(MID
(TIF,3,2)):MINS."
960 PRINT:PRINT:PRINTS#:"ANOTHER GAME?"
965 GET A#:IF A#="" THEN965
970 IFA#="" THENPRINT"YES":FORI=1 TO500:NEXTI
RESTORE:GOTO1
980 PRINT"NO":END
999 REM == FACING WALL DISPLAY ==
1000 C1=CL(1,CA)+(5-CA)+41:C2=CL(2,CA)+(5-CA)
*39:WH=DM(CA)-2*(5-CA)-1
1005 FORI=C1 TOC2:POKEI-40,60:NEXTI
1010 FORI=BOTOM:POKEI+40*I,UL(2):POKEC2+40*
I,UL(1):NEXT
1020 FORI=C1+40*WH TOC2+40*WH:POKEI+40,112:NEXT
1030 GOTO700
1049 REM == SFACE TO SIDE ==
1050 SI=TI:SJ=TJ
1060 IFOU=1 THENSI=SI-1:IFSI=0 THENG301
1070 IFOU=2 THENSI=SI+1
1080 IFOU=3 THENSI=SI-1
1090 IFOU=4 THENSI=SI+1
1100 TU=MS(SI,SJ):DR(DR)
1110 IFINT(TU)>TUTHENGOTO301
1120 DM=DM(CA)-2*(5-CA):CL=CL(SD,CA)+40*(4-CA):DM=3-2*SD
1130 FORI=CL TOCL+DM*(4-CA):STEMP:POKEI,60:NEXTI
1140 I=1+(37+2*SD):IFCR=4 THENI160
1150 TU=1:FORI=TUTOTU+40*(DM-1)STEP40:POKEI,UL(SD):NEXTI
1160 TU=1:FORI=TUTOTU+(DM-4-CA)STEP-DM:POKEI,112:NEXT
1170 GOTO301
1180 PRINT"0"
1190 PRINT"0"
1195 PRINT"0"
1200 PRINT"0"
1210 PRINT"0"
1220 PRINT"0"
1230 PRINT"0"
1240 PRINT"0"
1250 PRINT"0"
1260 PRINT"0"
1270 PRINT"0"
1280 PRINT"0"
1290 PRINT"0"
1300 PRINT"0"
1310 PRINT"0"
1320 PRINT"0"
1330 PRINT"0"
1340 PRINT"0"
1350 PRINT"0"
1360 PRINT"0"
1370 PRINT"0"
1380 PRINT"0"
1390 RETURN
1400 PRINT"0"
1410 PRINT"0"
1420 PRINT"0"
1430 PRINT"0"
1440 PRINT"0"
1450 PRINT"0"
1460 PRINT"0"
1470 PRINT"0"
1480 PRINT"0"
1490 PRINT"0"
1500 PRINT"0"
1510 PRINT"0"
1520 PRINT"0"
1530 PRINT"0"
1540 PRINT"0"
1550 PRINT"0"
1560 PRINT"0"
1570 PRINT"0"
1580 PRINT"0"
1590 PRINT"0"
1600 PRINT"0"
1610 RETURN
1620 PRINT"0"
1630 PRINT"0"
1640 PRINT"0"
1650 PRINT"0"
1660 PRINT"0"
1670 PRINT"0"
1680 PRINT"0"
1690 PRINT"0"
1700 PRINT"0"
1710 PRINT"0"
1720 PRINT"0"
1730 PRINT"0"
1740 PRINT"0"
1750 PRINT"0"
1760 PRINT"0"
1770 PRINT"0"
1780 PRINT"0"
1790 PRINT"0"
1800 PRINT"0"
1810 PRINT"0"
1820 PRINT"0"
1830 RETURN

```

GRAPHICAL

BY IAN TURTLE

RUNS ON A ZX81 IN 8K

GOLF

So you think you're another Arnold Palmer do you? Well, this round of golf will sort the men out from the boys!

Graphical Golf is an 18-hole simulation of the real game. It has been made as realistic as possible, with many of the features of the real thing.

Initially, the computer asks you if you would like a random or a normal course. If you choose the normal course, you will get the lengths and pars of holes stored in the REM statement in line 10.

If you choose the random course, you have access to over 65 000 different courses by inputting a number between 1 and 65 000+ in reply to "COURSE NO?". If you want to play that course again sometime, simply input the same number in response to "COURSE NO?". Finally, you asked to input your handicap, else input 24. If you play well enough, your handicap will be

reduced at the end of the round.

From now, you are on the course. If you have a ZX81, you will see the computer draw the hole, else, on the ZX80, the screen will simply go blank for 10 seconds or so. When the computer has finished, you will be presented with a graphical representation of a golf hole.

The computer will then ask you for your choice of club. You have 22 clubs, consisting of 1-4 woods, 1-9 irons and with their own percentage swing. Next you are asked to input an angle of shot. An input of 'O' degrees means straight ahead, '90' straight up, etc.

You'll encounter all the hazards of a real course, bunkers, the rough, and even water traps.

The computer will print out a scorecard for each round you play - and maybe even reduce your handicap should your performance warrant it!

```

10 REM 36143884206350054084359
4424438841963400456051323574294
44755375418835505
20 LET U=VAL "1"
30 LET Y=VAL "0"
40 PRINT TAB VAL "9";"GRAPHICA
L GOLF
50 PRINT
60 PRINT TAB VAL "7";" (C) IAN T
URTL 1981"
70 PRINT
80 PRINT "RANDOM OR NORMAL COU
RSE?"
90 PAUSE VAL "40000"
100 LET Z$=INK$Y$
110 IF Z$( < > "R" AND Z$( < > "N" THEN
GOTO VAL "80"
120 DIM L (VAL "18")
130 DIM P (VAL "18")
140 DIM S (VAL "18")
150 IF Z$="R" THEN GOTO VAL "25
0"
160 LET ZZ=VAL "16513"
170 FOR H=U TO VAL "18"
180 FOR A=U TO VAL "3"
190 LET ZZ=ZZ+U
200 LET L(H)=L(H)+VAL "10"+PEEK
(ZZ)-VAL "28"
210 NEXT A
220 LET ZZ=ZZ+U
230 LET P(H)=PEEK (ZZ)-VAL "28"
240 NEXT H
250 GOTO VAL "330"
260 PRINT "COURSE NO?"
270 INPUT ZZ
280 RAND ZZ
290 LET ZZ=Y
300 FOR H=U TO VAL "18"
310 LET L(H)=INT (RAND*VAL "420"
) VAL "181"
320 LET P(H)=VAL "3"+L(H)+VAL
"279"+L(H)+VAL "499"
330 NEXT H
340 PRINT "PAR=";ZZ
350 FOR A=U TO VAL "2"
360 NEXT A
370 LET A$=""
380 LET B$=""
390 FOR B=U TO VAL "32"
400 LET A$=A$+CHR$(VAL "8")
410 LET B$=B$+CHR$(VAL "8")
420 NEXT B
430 LET A$=A$+CHR$(VAL "8")
440 LET B$=B$+CHR$(VAL "8")
450 NEXT B
460 LET AS=Y
470 LET BS=Y
480 LET CS=Y
490 LET DS=Y
500 LET ES=Y
510 LET FS=Y
520 LET GS=Y
530 LET HS=Y
540 LET IS=Y
550 LET JS=Y
560 LET KS=Y
570 PRINT "HANDICAP?"
580 INPUT HA
590 RAND
600 CLS
610 LET DF=PEEK (VAL "16396"+VAL
"255");PEEK (VAL "16397")
620 FOR H=U TO VAL "18"
630 LET PR=PR+P(H)
640 LET SH=Y
650 FOR A=U TO VAL "18"
660 PRINT A$
670 NEXT A
680 PRINT "HOLE ";H;" DIST ";L
(H);" P ";P(H)
690 LET UP=VAL "3"+INT (RAND*VAL
"13")
700 LET TG=UP
710 FOR A=U TO L(H)/VAL "20"-U
720 FOR B=-U-(RAND).5 TO U+(RAND
) .5)

```

```

770 POKE (UP+B)*VAL "33"+A+DF, Y
780 NEXT B
790 LET UP=UP+(RAND).5)-(RAND).5
800 LET UP=UP-(UP)*VAL "15"+(UP
) VAL "2"
810 NEXT A
820 LET HP=INT (L(H)/VAL "20")-
U
830 FOR A=-U-(RAND).3 TO U+(RAND
) .3)
840 FOR B=-U-(RAND).3 TO U+(RAND
) .3)
850 POKE (UP+B)*VAL "33"+HP+A+D
F, VAL "128"
860 NEXT B
870 NEXT A
880 POKE UP*VAL "33"+HP+DF, VAL
"149"
890 POKE DF+TG*VAL "33"+U, VAL "
105"
900 LET ZZ=VAL "-3"+INT (RAND*VA
L "910")
910 LET YY=DF+(UP+ZZ)*VAL "33"+
HP
920 IF PEEK (YY) (< > VAL "8" AND P
EEK (YY) (> Y) THEN GOTO VAL "910"
930 POKE YY, VAL "52"
940 FOR A=U TO VAL "4"+(RAND).4)
950 LET ZZ=VAL "-3"-INT (RAND*VA
L "3")
960 LET XX=VAL "-3"+INT (RAND*VA
L "7")
970 LET YY=DF+(UP+XX)*VAL "33"+
HP+ZZ
980 IF PEEK (YY) (< > VAL "8" AND P
EEK (YY) (> Y) THEN GOTO VAL "950"
990 POKE YY, VAL "52"
1000 NEXT A
1010 NEXT A
1020 IF P(H) (VAL "4" THEN GOTO U
AL "1240"
1030 LET HP=VAL "10"

```

```

1040 FOR A=U TO VAL "4"+(RND>.4)
1050 LET ZZ=HP+INT (RND*VAL "4")
1060 FOR B=Z TO VAL "17"
1070 LET YY=DF+B*VAL "33"+ZZ
1080 IF PEEK (YY)<>Y THEN GOTO U
AL "1110"
1090 POKE YY,VAL "52"
1100 GOTO VAL "1120"
1110 NEXT A
1120 NEXT B
1130 IF P(H) (VAL "5" THEN GOTO U
AL "1240"
1140 LET HP=VAL "17"
1150 FOR A=U TO VAL "4"+(RND>.4)
1160 LET ZZ=HP+INT (RND*VAL "4")
1170 FOR B=Y TO VAL "17"
1180 LET YY=DF+B*VAL "33"+ZZ
1190 IF PEEK (YY)<>Y THEN GOTO U
AL "1220"
1200 POKE YY,VAL "52"
1210 GOTO VAL "1230"
1220 NEXT B
1230 NEXT A
1240 IF RND>.25 THEN GOTO VAL "1
330"
1250 LET HP=INT (L(H)/VAL "40")
1260 FOR A=Y TO VAL "17"
1270 POKE A=VAL "33"+HP+DF,VAL "
163"
1280 LET HP=HP+(RND>.5)-(RND>.5)
1290 LET HP=HP+(HP (VAL "2")-(HP)
= (H)/VAL "20")
1300 NEXT A
1310 LET HP=U
1320 LET UP=U
1330 LET PB=Y
1350 PRINT AT VAL "21",Y;"CLUB?"
1360 INPUT CI
1370 IF CI<U OR CI>VAL "29" OR CI
=U/VAL "4" AND CI<VAL "11" OR CI
=U/VAL "20" OR CI<MC THEN GOTO VAL
"1360"
1375 LET MC=Y
1380 IF CI>VAL "19" THEN GOTO VA
L "1410"
1390 LET PS=VAL "100"
1400 GOTO VAL "1450"
1410 PRINT AT VAL "21",Y;"PERCEN
TAGE SING?"
1420 INP PS
1440 IF PS<VAL "50" OR PS>VAL "1
00" THEN GOTO VAL "1430"
1450 PRINT AT VAL "21",Y;"SHOT A
NGLE?"
1470 INP AS
1480 IF AS<VAL "180" OR AS>VAL
"180" THEN GOTO VAL "1470"
1483 PRINT AT VAL "21",Y;B$
1484 PRINT AT VAL "20",Y;B$
1485 IF PB = V THEN POKE BP,YY
1490 LET AS=INT (AS+RND*(VAL "22
+HR)-RND*(VAL "22+HR))
1500 LET AS=(AS+PI)/VAL "180"
1510 LET SH=SH+U
1520 LET PS=PS*VAL "100"
1530 IF CI>VAL "20" THEN LET CI=
CI-VAL "10"
1533 IF CI>VAL "10" THEN LET CI=
CI-VAL "5"
1536 LET CI=VAL "16"-CI
1537 POKE DF+U,VAL "28"+SH
1540 LET HS=INT (((CI*(VAL "14
+INT (RND*VAL "3")))+PS+RC)+COS
(RS))/VAL "20")+.5)
1545 LET US=INT (((CI*(VAL "14
+INT (RND*VAL "3")))+PS+RC)+SIN
(RS))/VAL "20")+.5)
1547 LET RC=U
1550 LET BP=DF+HP+HS+(UP+US)*VAL
"33"
1560 IF HP+HS>VAL "32" OR HP+HS<
U OR UP+US<Y OR UP+US>VAL "17" T
HEN GOTO VAL "1670"
1580 LET YY=PEEK (BP)
1590 IF YY=VAL "152" THEN GOTO U
A 1720"
1595 LET B$=U TO VAL "3"
1600 FOR A=Y TO
1602 POKE BP,YY
1603 POKE VAL "50"
1604 POKE BP,VAL "155"
1605 POKE VAL "50"
1606 NEXT A
1610 IF YY=VAL "126" OR YY=VAL "
1649" THEN GOTO VAL "2000"
1620 IF YY=VAL "8" THEN GOTO VAL
"1750"

```

```

1630 IF YY=VAL "52" THEN GOTO UR
L "1830"
1640 PRINT AT VAL "20",Y;B$
1650 PRINT AT VAL "20",Y;"ON FAI
RUARY"
1660 GOTO VAL "1930"
1670 PRINT AT VAL "20",Y;B$
1680 PRINT AT VAL "20",Y;"OUT OF
BOUNDS-PENELTY 1 STROKE"
1690 LET SH=SH+U
1695 LET PB=Y
1700 PAUSE VAL "100"
1710 GOTO VAL "1340"
1720 PRINT AT VAL "20",Y;B$
1730 PRINT AT VAL "20",Y;"SPLASH
IN WATER-PEN. 1 STROKE"
1740 GOTO VAL "1690"
1750 PRINT AT VAL "20",Y;B$
1755 LET MC=VAL "1"
1760 IF RND>.4 THEN GOTO VAL "18
00"
1770 PRINT AT VAL "20",Y;"IN HEA
DY ROUGH"
1780 LET RC=.6+RND/VAL "5"
1790 GOTO VAL "1930"
1800 PRINT AT VAL "20",Y;"IN LIG
HT ROUGH"
1810 LET RC=.8+RND/VAL "5"
1820 GOTO VAL "1930"
1830 PRINT AT VAL "20",Y;B$
1840 PRINT AT VAL "20",Y;"BUNKER
ED-"
1850 LET ZZ=INT (RND*VAL "3")
1860 IF ZZ=U THEN PRINT "GOOD"
1870 IF ZZ=U THEN LET MC=VAL "24
+INT (RND*VAL "2")"
1880 IF ZZ=Y THEN PRINT MC*VAL "26
1890 IF ZZ=Y THEN LET MC=VAL "26
+INT (RND*VAL "2")"
1900 IF ZZ=VAL "2" THEN PRINT "B
AD"
1910 IF ZZ=VAL "2" THEN LET MC=U
VAL "26"+INT (RND*VAL "2")"
1915 LET RC=.7-ZZ/VAL "10"+RND/U
VAL "5"
1920 PRINT "LIE,MAX,CLUB ";MC
1930 PAUSE VAL "100"
1940 LET HP=HP+HS
1950 LET UP=UP+US
1960 GOTO VAL "1350"
2000 LET HP=HP+HS
2010 PRINT AT VAL "20",Y;B$
2020 PRINT AT VAL "20",Y;"ON THE
GREEN IN /SH
2030 PAUSE VAL "150"
2040 CLS
2050 PRINT TAB VAL "17", " "
2060 PRINT TAB VAL "17", " "
2070 PRINT TAB VAL "17", " "
2080 FOR A=U TO VAL "6"
2090 PRINT TAB VAL "20", " "
2100 NEXT A
2140 PRINT "
2150 POKE DF+VAL "52" VAL "128"+
VAL "29"*(INT (H/VAL "10")+U)
2160 POKE DF+VAL "55" VAL "156"+
H-INT (H/VAL "10")+VAL "10"
2170 LET TG=VAL "2"+INT (RND*VAL
"10")
2180 IF TG=VAL "2" THEN PRINT "S
LOW"
2190 IF TG=VAL "3" THEN PRINT "M
EDIUM"
2200 IF TG=VAL "4" THEN PRINT "F
AST"
2210 PRINT "GREEN"
2220 PRINT AT VAL "12",VAL "3";"
FT.FROM PIN"
2230 LET YY=ABS (HP+U-INT (L(H) /
VAL "20"))
2240 LET BP=INT (YY*VAL "20"+RND
*VAL "20")+U
2250 PRINT AT VAL "12",Y;" "
2260 PRINT AT VAL "12",Y;ABS BP
2270 IF ABS BP<VAL "2" THEN GOTO
VAL "2460"
2280 LET YY=VAL "20"-INT (1/BP*VA
L "3")+U)
2290 IF YY>VAL "32" THEN LET YY=
VAL "3"
2300 IF YY<U THEN LET YY=U+(YY
-VAL "21")
2310 LET YY=YY-1*Y=VAL "20"
2320 POKE DF+VAL "297"+YY,VAL "5
0"
2330 PRINT AT VAL "13",Y;"PUTTIN

```



```

0000 STRENGTH?(1-20)
0001 400 INPUT ZZ
0002 500 IF ZZ < U OR ZZ > VAL "20" THEN
0003 600 UAL "2340"
0004 360 IF BP < Y THEN LET XX=U
0005 370 IF BP > Y THEN LET XX=-U
0006 200 POKE DF+VAL "297"+YY,VAL "9
0007 400 PAUSE UAL "60"
0008 410 FOR A=U TO ZZ
0009 420 LET BP=BP+XX*(U+INT (RND*TG
))
0010 430 NEXT A
0011 440 LET SH=SH+U
0012 450 UAL "2250"
0013 460 POKE DF+VAL "317",VAL "52"
0014 470 PAUSE UAL "50"
0015 480 POKE DF+VAL "317",VAL "131"
0016 490 PAUSE UAL "100"
0017 500 CLS
0018 510 PRINT "YOU HOLED OUT IN ";S
SHOTS";
0019 520 LET S(H)=SH
0020 530 LET ZZ=SH-A(H)
0021 540 IF ZZ>VAL "-3" THEN PRINT "
SCCELLANT-AN ALBERTROSS"
0022 550 IF ZZ=VAL "-2" AND P(H)=VAL
"3" THEN PRINT "UNBELIEVABLE-A
HOLE IN ONE"
0023 560 IF ZZ=VAL "-2" AND P(H) < UA
"3" THEN PRINT "GREAT-AN EAGLE
"
0024 570 IF ZZ=VAL "-1" THEN PRINT "
GOOD-VA BIRDIE"
0025 580 IF ZZ=Y THEN PRINT "WELL DO
NE-A
PAR"
0026 590 IF ZZ=U THEN PRINT "HHHHMM-
BOGEY"
0027 600 IF ZZ>U THEN PRINT "KEEP YO
UR HEAD DOWN"
0028 610 PRINT
0029 620 LET TS=TS+SH
0030 630 LET ZZ=TS-PA
0031 640 PRINT "YOU ARE NOW ";
0032 650 IF ZZ < Y THEN PRINT ABS ZZ;"
UNDER";
0033 660 IF ZZ=Y THEN PRINT "LEVEL";
0034 670 IF ZZ>Y THEN PRINT ZZ;" OVE
R";
0035 680 PRINT "PAR (GROSS) "
0036 690 PRINT
0037 700 PRINT "GROSS-VA PAR-VA"
0038 710 PAUSE UAL "40000"
0039 720 CLS
0040 730 NEXT H
0041 740 PRINT TAB VAL "12";;"SCORE"
0042 750 PRINT TAB VAL "3";;"HOLE";TA
B VAL "11";;"DIST";TAB VAL "19";;"
PAR";TAB VAL "26";;"SHOTS"
0043 760 FOR H=U TO VAL "18"
0044 770 PRINT TAB VAL "4";H;TAB VAL
"12";L(H);TAB VAL "20";P(H);TAB
VAL "28";S(H)
0045 780 NEXT H
0046 790 PRINT "PAR (NET)";TAB VAL "19
";PA;TAB VAL "27";TS
0047 800 PAUSE UAL "40000"
0048 810 CLS
0049 820 PRINT "YOU TOOK ";TS;" SHOT
"
0050 830 PRINT "(NET ";TS-HA;") "
0051 840 PRINT
0052 850 LET ZZ=TS-PA-HA
0053 860 PRINT "YOU FINISHED ";
0054 870 IF ZZ < Y THEN PRINT ABS ZZ;"
UNDER";
0055 880 IF ZZ=Y THEN PRINT "LEVEL";
0056 890 IF ZZ>Y THEN PRINT ZZ;" OVE
R";
0057 900 PRINT "PAR (NET) "
0058 910 IF HA=Y THEN STOP
0059 920 IF ZZ>VAL "-2" THEN LET PD=
Y
0060 930 IF ZZ < -U THEN LET PD=-U
0061 940 IF ZZ < VAL "-3" THEN LET PD=
VAL "-2"
0062 950 IF ABS PD>HA THEN LET PD=-H
A
0063 960 PRINT
0064 970 PRINT "AS A RESULT:"
0065 980 IF PD=Y THEN GOTO VAL "3020
"
0066 990 PRINT "HANDICAP IS DOWN ";A
BS PD;" SHOTS";" TO ";HA+PD
0067 3000 PRINT "YOU HANDICAP STAYS A
T ";HA;" SHOTS"
0068 3030 STOP

```

DODGEMS

BY S. JAMES & R. NURSE

RUNS ON A BBC MODEL B

Vroom, vroom! Here they and one green. You are in come - it's the duelling control of the green car. dodgems! The computer controls the

But these are not really red one.

like those old fairground The computer-car will favourites. There's more proceed to rush around than a touch of motorway the track in he opposite madness in this game. direction to your red car

Your BBC micr will set - and it's aim is up a square-shaped race extremely unfriendly. It track for you - and two wants to knock you off the cars will appear. One red road as quickly as possible. You must avoid the

computer car.

IN 32K

```

10:high=0
20:MODE 7:PROC INSTRUCT
30:MODE 2:PROCSE TUP;REM LAST PIECE OF PROGRAM
40:SETS UP VARIOUS COLOURS ETC.
405C=0:ENVELOPE1,3,0,0,0,0,0,121,-10,-5,-2,
120,120
50H=0:ENERROR MODE7:END
60VDU23,1,0,0,0,0,0,1
70GOSUB150:GOSUB150
80PROC DRAW:PROC FILLING
90PROC MOVE1
100:IF YD<=OY AND YAX<=OX THEN1040
110:PROC MOVE2
120:IF YD<=OY AND YAX<=OX THEN1040
130B0T090
140END
150VDU23,250,0,238,68,255,255,68,238,0
160VDU23,251,24,90,128,90,24,90,128,90
170VDU23,128,255,255,255,255,255,255,255
180YD<=15:YAX<=7:CAR#<CHR#251
190X<=2:OY<=2:CAR#<CHR#251
200X#<1:MY=0:HM=0:VM#<1
210:TURN
220:DEF PROC DRAW
230:COLOURBACKCOL:COLOURFORCOL
240CLS
250PRINT " SCORE:"
260PRINT" ~~~~~"
270PRINT" ~~~~~"
280PRINT" ~~~~~"
290PRINT" ~~~~~"
300PRINT" ~~~~~"
310PRINT" ~~~~~"
320PRINT" ~~~~~"
330PRINT" ~~~~~"
340PRINT" ~~~~~"
350PRINT" ~~~~~"
360PRINT" ~~~~~"
370PRINT" ~~~~~"
380PRINT" ~~~~~"
390PRINT" ~~~~~"
400PRINT" ~~~~~"
410PRINT" ~~~~~"
420PRINT" ~~~~~"
430PRINT" ~~~~~"
440PRINT" ~~~~~"
450PRINT" ~~~~~"
460PRINT" ~~~~~"
470PRINT" ~~~~~"
480PRINT" ~~~~~"
490PRINT" ~~~~~"
500PRINT" ~~~~~"
510PRINT" ~~~~~"
520PRINT" ~~~~~"
530PRINT" ~~~~~"
540:END PROC
550:DEF PROC MOVE1
560A="23A:HA=0:FX15,0
570PRINT TAB (YAX, YDX) "; ; IF A#0 THEN610

```

```

580M=( (SGN(HM)<0)-(SGN(VM)<0))*2*((A=178)-(A=193))
590IF FNREADCH(YA%+VM*SGN(M),YD%+HM*SGN(M))<>"*" AND FNREADCH(YA%-VM*H/2,YD%-HM*H/2)="* THE
M(<)" THEN YA%=YA%+VM*H;YD%=YD%+HM*H;IF FNREADCH(YA%-VM*H/2,YD%-HM*H/2)="* SC=SC+score;COLOURscr=COLOURscr+PRINTTAB(8,0);SC
FNPRINTTAB(YA%-VM*H/2,YD%-HM*H/2);": SC=SC+score;COLOURscr=COLOURscr+PRINTTAB(8,0);SC
600REM
610REM MOVE AROUND THE MAZE
620TY=YD%+VM;TX=YA%+HM;A#=#FNREADCH(TX,TY)
630IFA#=#," THENSC=SC+score;COLOURscr=COLOURscr+PRINTTAB(8,0);SC
640IFA#("<" " ANDA#("<" " " PROCCN#
650YD%=YD%+VM;YA%=YA%+HM;SOUND1,1,100,1
660COLOURscr=COLOURscr+PRINTTAB(YA%,YD%)CAR#
670ENDPROC
680DEFFPROCCH#
690IFVM#1 AND HM#0 THENVM#0;HM#1;CAR#=#CHR#250;ENDPROC
700IFVM#0 AND HM#1 THENVM#1;HM#0;CAR#=#CHR#251;ENDPROC
710IFVM#-1 AND HM#0 THENVM#0;HM#-1;CAR#=#CHR#250;ENDPROC
720IFVM#0 AND HM#-1 THENVM#1;HM#0;CAR#=#CHR#251;ENDPROC
730DEFFFNREADCH(X,Y)
740LOCALAS, LASTX, LASTY,C
750LASTY#D#S;LASTY#V#F#S
760VDU1,X,Y
770A#=#135;C=#USR(MFFF) AND MFFF
780C=#DIV 8;100
790VDU1, LASTX, LASTY
800=#CHR#(C)
810DEFFPROCMOVE2
820TX=#X+DX;TY=#Y+DY
830A#=#FNREADCH(TX,TY)
840IF A#=# THEN PROCCN#
850COLOURscr=COLOURscr+PRINTTAB(DX,DY);":
860COLOURscr=COLOURscr+PRINTTAB(TX,TY);CAR2#=#SOUND1,-8,50,1
870O#=#X;DY=#Y;PROCCN#LANE
880ENDPROC
890DEFFPROCCH#
900IF MX#0 AND MY#1 THEN MX#-1;MY#0;CAR2#=#CHR#250;BOTD940
910IF MX#-1 AND MY#0 THEN MX#0;MY#-1;CAR2#=#CHR#251;BOTD940
920IF MX#0 AND MY#-1 THEN MX#1;MY#0;CAR2#=#CHR#250;BOTD940
930IF MX#1 AND MY#0 THEN MX#0;MY#1;CAR2#=#CHR#251;BOTD940
940TX=#X+DX;TY=#Y+DY;ENDPROC
950DEFFPROCCH#LANE
960DI=#RND(3)-2;IFDI#0 THENP#0
970A#=#FNREADCH(DX+MY*DI,DY+MX*DI)
980IFA#=# THENENDPROC
990A#=#FNREADCH(DX+MY*DI*2,DY+MX*DI*2)
1000IFA#=# THENENDPROC
1010COLOURscr=COLOURscr+PRINTTAB(DX,DY);":
1020DX=#X+MY*DI*2;DY=#Y+MX*DI*2
1030COLOURscr=COLOURscr+PRINTTAB(DX,DY);CAR#=#ENDPROC
1040REMIT
1050VDU2,240,0,0,0,24,24,0,0,0
1060VDU2,241,0,0,0,60,36,36,60,0,0
1070VDU2,242,0,126,66,66,66,66,126,0
1080VDU2,243,255,129,129,129,129,129,129,255
1090X=#X;Y=#Y
1100FRT=#1;T#45
1110VDU1;SCDLO,mdcol
1120MOVE#64,1020-Y#32
1130IF T AND 1<>0 THENPRINTCHR#240;MOVE#64,1020-Y#32
1140IF T AND 2<>0 THENPRINTCHR#241;MOVE#64,1020-Y#32
1150IF T AND 4<>0 THENPRINTCHR#242;MOVE#64,1020-Y#32
1160IF T AND 8<>0 THENPRINTCHR#243;MOVE#64,1020-Y#32
1170VDU4;PRINTTAB(DX,DY);": SOUND1,1,255-T#255/45,1;NEXT
1180CL#=#FX15,0
1190MODE7;PRINTTAB(5,10);"You scored ";SC
1200IF high#SC THEN high#SC
1210PRINTTAB(5,11);"High Scores";high
1220PRINT" Do you want another go?"
1230A#=#GET#
1240IFA#=#Y THENSC
1250IFA#=#N THENCL#=#END
1260PRINTTAB(5,13);"Just a simple Y or N is sufficient.";BOTD1250
1270DEFFPROCILLING
1280REPEAT 1460;SCDLO,mdcol;VDU5
1290MOVE,up
1300FRT=#1;T#26;READA#;PRINT" A#=#NEXT
1310VDU4;ENDPROC
1340DEFFPROCINSTRUCT
1350PRINTTAB(13);CHR#141;"DODGERS"
1360PRINTTAB(13);CHR#141;"DODGERS"
1370PRINTTAB(14);"*****"
1380PRINTTAB(3);"Welcome to the game of Dodgess."
1390PRINT" In this you have a picture of a square Race track. There are also two
cars. The Red Car and The Green Car. The only control you have over yo
ur car (the green one) is that of either moving in to a smaller
or out to a larger one. The red cars go around the track in an o
pposite directions to you. To avoid it you must use these controls:"
1410PRINT" A-Move in."
1420PRINT" D-Move out."
1430PRINT" Happy Dodgessing!"
1440PRINT" Press space to start."
1450REPEAT A#=#GET#;UNTIL A#=#"ENDPROC

```

```

1460DATA.....
1470DATA.....
1480DATA.....
1490DATA.....
1500DATA.....
1510DATA.....
1520DATA.....
1530DATA.....
1531DATA.....
1532DATA.....
1533DATA.....
1540DATA.....
1550DATA.....
1560DATA.....
1570DATA.....
1571DATA.....
1580DATA.....
1590DATA.....
1600DATA.....
1610DATA.....
1620DATA.....
1630DATA.....
1640DATA.....
1650DATA.....
1660DATA.....
1670DATA.....

```

```

1000DEFFPROCSETUP
1001up=#99;REM Start position of dots
1002backcol=#132;REM Background colour
1003forcol=#61;REM Foreground colour
1004ymurcol=#2;REM Colour of controlled car
1005dotcol=#3;REM Colour of dots
1006rncol=#1;REM Colour of random car
1007ocrcol=#1;REM Colour of score
1008incrcol=#10;REM Increment of score
1009endcol=#3;REM Colour of end graphics
1010ENDPROC

```


PACMAN

BY NEIL FORSYTH

RUNS ON AN APPLE IN 48K

Munch your way around a maze in this adaptation of the game that has inspired pop-records, t-shirts, pinball machines, TV adverts and thousands of imitators. It's all here. The ghosts out to munch the greedy little pacman. The power pills which enable the Pacman to devour the ghosts. And all the devious twists and turns of the maze itself.

There's an indicator at the bottom of the screen which tells you when the ghosts are vulnerable to attack. To help the Pacman the maze has two sneaky escape exits at either side which could help you baffle those deadly ghosts.

To control your Pacman use keys 'I' for up, 'J-left', 'K-right', 'M-down. Just one warning - don't play this game between meals, it could ruin your appetite!

```
0 S = 0:L = 3: GOSUB 3000: DIM VA(14,11)
1 HOME : NORMAL
5 GOSUB 6000: GOSUB 10000
10 FOR Y = 0 TO 11
15 FOR X = 0 TO 14
20 READ A:VA(X,Y) = A
22 IF S > 2230 AND A / 13 = INT (A / 13) THEN A = (A / 13) * SGN
(S - 4470):VA(X,Y) = A:NE = 1
25 NEXT X
27 NEXT Y
28 IF S > 0 THEN VA(0,5) = 0:VA(1,5) = 30:VA(14,5) = 0:VA(13,5) =
70:TB = 1
30 GOSUB 5000: ROT= 0: XDRAW 3 AT 129,145: XDRAW 2 AT 139,145: XDR
AW 3 AT 149,145
32 ROT= 0: SCALE= 1: FOR P = 1 TO L: XDRAW 2 AT P * 10 + 119,10: N
EXT P
35 V = 10:DI = 0:D = - 1:A = 139:OA = A:B = 64:OB = B: ROT= 0: XDR
AW 3 AT OA,OB
40 X = 139:Y = 114:R = 0
45 OX = X:OY = Y:RO = R: ROT= RO: XDRAW 2 AT OX,OY
47 HOME : IF NE = 1 THEN INVERSE : VTAB (21): PRINT " NO TUNN
EL AND NO ENERGIZERS ": NORMAL : GOTO 50
48 HOME : IF TB = 1 THEN INVERSE : VTAB (21): PRINT " THE TU
NNEL IS BLOCKED ": NORMAL
50 VTAB (22): FLASH : PRINT " HIT ANY KEY TO START
": POKE - 16368,0: WAIT - 16384,128: NORMAL
60 HOME : VTAB (21): PRINT " SCORE="
100 FOR T = 1 TO 2 STEP 0
110 K = PEEK ( - 16384)
120 XA = (OX - 69) / 10:YA = (OY - 24) / 10:PA = VA(XA,YA)
125 IF K = 201 THEN R = 0: IF PA / 2 = INT (PA / 2) THEN Y = Y -
V
130 IF K = 205 THEN R = 32: IF PA / 5 = INT (PA / 5) THEN Y = Y +
V
135 IF K = 202 THEN R = 48: IF PA / 7 = INT (PA / 7) THEN X = X -
V: IF X < 69 THEN X = 209
140 IF K = 203 THEN R = 16: IF PA / 3 = INT (PA / 3) THEN X = X +
V: IF X > 209 THEN X = 69
142 XA = (X - 69) / 10:YA = (Y - 24) / 10:PA = VA(XA,YA)
145 ROT= RO: XDRAW 2 AT OX,OY: ROT= R: XDRAW 2 AT X,Y
146 OX = X:OY = Y:RO = R
147 IF (A = X) * (B = Y) * (SF = 0) THEN GOTO 1000
150 IF PA > 0 AND PA / 13 < > INT (PA / 13) THEN ROT= 0: XDRAW
```

```

1 AT X,Y: POKE 768,96: POKE 769,3: CALL 770:VA(XA,YA) = - PA:DT
= DT - 1:S = S + 10: VTAB (21): HTAB (20): PRINT S: IF DT = 0 THEN
GOTO 2000
152 IF SF = 1 THEN ROT= 0: RETURN
155 IF PA > 0 AND PA / 13 = INT (PA / 13) THEN ROT= 0: XDRAW 4 A
T X,Y: FOR P = 10 TO 1 STEP - 1: POKE 768,P: POKE 769,3: CALL 77
0: NEXT P:VA(XA,YA) = - PA: GOSUB 600
200 GH = VA(OA - 69) / 10:(OB - 24) / 10)
205 D = - D:DI = 0
207 IF (Y = B) THEN GOTO 215
210 IF D < 0 OR (X = A) THEN GOTO 255
215 IF (X > A) THEN GOTO 240
220 IF GH / 7 = INT (GH / 7) THEN A = A - V: GOTO 320
230 GOTO 250
240 IF GH / 3 = INT (GH / 3) THEN A = A + V: GOTO 320
250 DI = DI + 1:D = - 1: IF DI = 2 THEN GOTO 285
255 IF Y > B THEN GOTO 270
260 IF GH / 2 = INT (GH / 2) THEN B = B - V: GOTO 320
265 GOTO 275
270 IF GH / 5 = INT (GH / 5) THEN B = B + V: GOTO 320
275 DI = DI + 1:D = 1: IF DI = 2 THEN GOTO 285
280 GOTO 215
285 IF (X - A) * SGN (X - A) > (Y - B) * SGN (Y - B) THEN GOTO
300
290 IF GH / 7 = INT (GH / 7) THEN A = A - V:D = 1: GOTO 320
295 A = A + V:D = 1: GOTO 320
300 IF GH / 2 = INT (GH / 2) THEN B = B - V:D = - 1: GOTO 320
305 B = B + V:D = - 1
320 IF A > 209 THEN A = 69
323 IF A < 69 THEN A = 209
325 ROT= 0: XDRAW 3 AT OA,OB: XDRAW 3 AT A,B: IF (A = X) * (B = Y)
THEN GOTO 1000
330 OA = A:OB = B
400 NEXT T
600 SF = 1: ROT= 0: XDRAW 3 AT 129,145: XDRAW 2 AT 139,145: XDRAW 3
AT 149,145: XDRAW 2 AT 129,145: XDRAW 3 AT 139,145: XDRAW 2 AT 1
49,145
610 FOR Z = 1 TO 15
620 GOSUB 110: IF (X = A) * (Y = B) THEN GOSUB 800: GOTO 700
630 P = INT (RND (1) * 3)
635 GH = VA(OA - 69) / 10:(OB - 24) / 10)
640 IF P = 2 AND GH / 5 = INT (GH / 5) THEN B = B + V
650 IF P = 0 AND GH / 2 = INT (GH / 2) THEN B = B - V
660 IF P = 3 AND GH / 7 = INT (GH / 7) THEN A = A - V: IF A < 69
THEN A = 209
670 IF P = 1 AND GH / 3 = INT (GH / 3) THEN A = A + V: IF A > 209
THEN A = 69
680 ROT= 0: XDRAW 3 AT OA,OB: XDRAW 3 AT A,B:OA = A:OB = B
690 IF (X = A) * (Y = B) THEN GOSUB 800
700 NEXT Z
710 SF = 0: ROT= 0: XDRAW 2 AT 129,145: XDRAW 3 AT 139,145: XDRAW 2
AT 149,145: XDRAW 3 AT 129,145: XDRAW 2 AT 139,145: XDRAW 3 AT 1
49,145
715 FOR P = 1 TO 15:Z = PEEK ( - 16336): NEXT P
720 RETURN
800 XDRAW 3 AT A,B:A = 139:B = 64:OA = A:OB = B: FOR P = 1 TO 5: P
RINT CHR$(7):; NEXT P:Z = 15: XDRAW 3 AT OA,OB:S = S + 100: VTA
B (21): HTAB (20): PRINT S: RETURN
1000 ROT= R: XDRAW 2 AT X,Y: SCALE= 2: FOR R = 0 TO 128 STEP 8: RO
T = R: XDRAW 2 AT X,Y:D = PEEK ( - 16336): NEXT R: POKE - 16368,
0: HOME : VTAB (21): HTAB (15): PRINT "SCORE = ";S
1005 XDRAW 2 AT X,Y: ROT= 0: SCALE= 1: XDRAW 3 AT A,B: XDRAW 2 AT

```

```

L * 10 + 119,10:L = L - 1: IF L > 0 THEN 35
1010 PRINT "DO YOU WANT ANOTHER GAME? "; FOR P = 1 TO 500: NEXT P
: POKE - 16368,0: GET Q$: IF Q$ = "Y" THEN CLEAR : DIM VA(14,11
):L = 3: GOTO 1
1020 TEXT : HOME : END
1100 REM *****
2000 HOME : UTAB (22): FLASH : PRINT "PERFECT SCORE. WELL DONE
      ": FOR P = 1 TO 15: POKE 768,16 - P: POKE 769,6: CALL
      "": FOR P = 1 THEN POP
770: NEXT P: RESTORE : IF SF = 1 THEN POP
2005 SF = 0: GOTO 1
3000 TEXT : HOME
3010 PRINT "*****";
3020 PRINT "*****"; FLASH : PRINT "
      "": NORMAL : PRINT "*****";
3025 PRINT "*****"; FLASH : PRINT "
      "": NORMAL : PRINT "*****";
3030 PRINT "*****";
3040 PRINT : PRINT "SINCE THE GAME IS WELL KNOWN HERE ARE SIMPLE
      INSTRUCTIONS"
3050 PRINT
3060 PRINT " KEY ACTION"
3070 PRINT " ---"
3080 PRINT " I UP"
3090 PRINT " J LEFT"
3100 PRINT " K RIGHT"
3110 PRINT " M DOWN"
3120 PRINT " OTHER KEYS STOP"
3130 PRINT : PRINT " LARGE DOTS ARE ENERGIZERS."
3140 PRINT : PRINT " GHOST VULNERABILITY IS INDICATED AT THE SCREE
      N BOTTOM BY TWO PACHMEN WITH GHOST IN THE MIDDLE."
3150 PRINT : PRINT : FLASH : PRINT "HIT ANY KEY FOR SCREEN SET UP
      "": NORMAL : GET ZZ$: RETURN
5000 HGR
5002 FOR Y = 0 TO 11
5005 FOR X = 0 TO 14
5010 A = VA(X,Y)
5015 K = 69 + X * 10:V = 24 + Y * 10
5020 HCOLOR= 7
5050 IF A / 2 < > INT ( A / 2 ) THEN H PLOT K - 5,V - 5 TO K + 5,V
      - 5
5055 IF A / 3 < > INT ( A / 3 ) THEN H PLOT K + 5,V - 5 TO K + 5,V
      + 5
5060 IF A / 5 < > INT ( A / 5 ) THEN H PLOT K - 5,V + 5 TO K + 5,V
      + 5
5065 IF A / 7 < > INT ( A / 7 ) THEN H PLOT K - 5,V - 5 TO K - 5,V
      + 5
5067 IF A > 0 AND A / 13 = INT ( A / 13 ) THEN XDRAW 4 AT K,V: GOT
      0 5400
5070 IF A > 0 THEN XDRAW 1 AT K,V:DT = DT + 1
5400 NEXT X
5410 NEXT Y
5420 H PLOT 0,0 TO 64,19: H PLOT 279,0 TO 214,19: H PLOT 0,159 TO 64,
      139: H PLOT 279,159 TO 214,139
5500 RETURN
6000 FOR X = 770 TO 792
6010 READ Y
6020 POKE X,Y
6030 NEXT X
6040 DATA 173,48,192,136,208,5,206,1,3,240,9,202,208,245,174,0,
      3,76,2,3,96,0,0
6050 RETURN
10000 HGR2 : POKE 232,16: POKE 233,64

```

```

10005 TEXT
10010 SCALE= 1: ROT= 0
10020 FOR X = 16400 TO 16460
10030 READ Y
10040 POKE X,Y
10050 NEXT X
10055 RETURN
10060 DATA 4,0,10,0,16,0,31,0,51,0
10070 DATA 42,36,63,54,21,0
10080 DATA 18,27,39,36,44,44,9,49,53,54,62,62,63,39,0
10090 DATA 46,30,46,9,36,39,37,39,39,63,46,62,35,23,46,21,63,54,6,
0
10100 DATA 53,30,60,60,12,37,21,21,6,0
20000 DATA 15,21,105,21,105,21,35,0,15,21,105,21,105,21,35
20010 DATA 10,15,42,35,6,35,30,273,70,15,14,15,42,35,10
20030 DATA 30,910,0,30,21,210,70,0,30,210,21,70,0,390,70
20040 DATA 10,6,105,14,15,14,30,21,70,6,35,6,105,14,10
20050 DATA 6,35,30,21,210,21,-210,-21,-210,21,210,21,70,15,14
20060 DATA -21,210,210,21,210,21,-70,0,-30,21,210,21,210,210,-21
20070 DATA 15,14,30,35,6,35,-6,-105,-14,15,14,15,70,6,35
20080 DATA 30,105,14,30,21,210,105,42,105,210,21,70,6,105,70
20090 DATA 10,30,21,70,15,14,30,105,70,6,35,30,21,70,10
20100 DATA 30,70,0,30,14,195,14,-10,6,455,6,70,0,30,70
20110 DATA 10,6,105,14,15,14,15,42,35,6,35,6,105,14,10
20120 DATA 6,21,42,21,42,21,14,0,6,21,42,21,42,21,14

```

VICTORIAN SEWERS

Chaos in the city as the ancient sewers start to collapse. Can you rebuild them before the city slips into a giant hole in the ground?

Your job is to keep the traffic flowing around the city's gradually eroding road system.

This program is in TI Basic for a 99/4A console with no additions. It will also run in Extended Basic, and if you have the 32K expansion memory, it will run faster in Extended Basic than in TI basic.

This program uses several tricks you may find useful: The play board is set up with PRINT statements - the fastest way of doing this. The characters (the UNDERLINE is used here) are defined.)

Note the use of POS in lines 1680 and 690 - the neatest way of reacting to a CALL KEY input. If the key pressed does not appear in the first string then the pro-

gram will goto/gosub the first line transfer, as the POS function will return nil.

Although TI Basic does not support AND and OR, these ARE used in this program, in lines 980 (* used for AND) and in line 1270 (+ used for OR) - also several other lines. Note the expressions are placed in brackets in these lines.

For greater speed the routines you plan are stored in a two dimensional array RT(N,M) which is read back to delete a route which suffers from a road collapse.

Conversion: Pretty easy. The screen is composed of 24 rows of 32 characters. The PRINT lines start in column 3, and as they all start with a space, the first PRINTED is in column 4.

CALL HCHAR is in the format: CALL HCHAR (ROW, COLUMN, ASCII. No of times)

CALL GCHAR is in the for-

mat: CALL GCHAR (ROW, COLUMN, VARIABLE) in which the variable takes the ASCII code of the character at that position.

The characters take the codes given in lines 2290-2340 and are all coloured blocks except the player (PLY) who is an 'R'.

Owners of machines with memory mapped screen

should recognise the formula in lines (1870 (encryption) and 1400-1410 (decoding) - this program does not look at column 32 so a slight approximation has been used.

For machines without the POS function, you will need to test the key pressed and GOTO/GOSUB as appropriate.

```

30 REM
31 REM SETTING UP THE BOARD
32 REM USE UNDERLINE:   
33 REM -----
100 DEF V1=RND*10
110 DEF V2=RND*12
120 DEF F1=RND*290+110
130 DEF F2=RND*290+110
140 DEF TM=RND*500+300
150 DIM RT(2,70)
160 DEF FR=RND*100+400
170 S=30000
180 GOSUB 1930
190 CALL CLEAR
200 PRINT
210 PRINT " -----
-----"
220 PRINT " - - - - -"
-----"
230 PRINT " - - - - -
-----"

```

BY STEPHEN SHAW

RUNS ON A TEXAS TI 99/4a

IN 4K

```

240 PRINT " - - - - -
-
250 PRINT " -----
-
260 PRINT " - - - - -
-
270 PRINT " - - - - -
-
280 PRINT " -----
-
290 PRINT " - - - - -
-
300 PRINT " -----
-
310 PRINT " -----
-
320 PRINT " - - - - -
-
330 PRINT " -----
-
340 PRINT " - - - - -
-
350 PRINT " - - - - -
-
360 PRINT " -----
-
370 PRINT " - - - - -
-
380 PRINT " -----
-
390 PRINT " - - - - -
-
400 PRINT " -----
-
410 PRINT
420 PRINT
430 CALL HCHAR(11,1,UTR,32)
440 CALL HCHAR(12,1,LTR,32)
450 REM ROAD MAP DRAWN
460 CALL COLOR(1,4,4)
470 CALL HCHAR(11,13,HOLE,6)
480 CALL HCHAR(12,13,HOLE,6)
490 CALL HCHAR(11,4,RD,9)
500 CALL HCHAR(12,4,RD,9)
510 CALL HCHAR(11,19,RD,9)
520 CALL HCHAR(12,19,RD,9)
530 A=1
540 RDW=11
550 COL=4
560 GOSUB 1520
570 A=2
580 RDW=12
590 COL=4
600 GOSUB 1520
610 CALL GCHAR(11,9,CDE)
620 REM CONTROL SECTION
630 CALL KEY(0,K,ST)
640 IF RND<.99 THEN 660
650 CALL SOUND(TM,F1,V1,F2,V2)

```

```

660 CALL HCHAR(RR,RC,PLY)
670 CALL HCHAR(RR,RC,CDE)
680 IF ST<1 THEN 630
690 DN POS("ESD&R",CHR$(K),1)+1
GOSUB 720,730,790,850,910,980
700 GOSUB 1190
710 GOTO 630
720 RETURN
730 CALL GCHAR(RR-1,RC,CD)
740 IF CD=32 THEN 780
750 RR=RR-1
760 CALL HCHAR(RR,RC,PLY)
770 CDE=CD
780 RETURN
790 CALL GCHAR(RR,RC-1,CD)
800 IF CD=32 THEN 780
810 RC=RC-1
820 CALL HCHAR(RR,RC,PLY)
830 CDE=CD
840 RETURN
850 CALL GCHAR(RR,RC+1,CD)
860 IF CD=32 THEN 840
870 RC=RC+1
880 CALL HCHAR(RR,RC,PLY)
890 CDE=CD
900 RETURN
910 CALL GCHAR(RR+1,RC,CD)
920 IF CD=32 THEN 900
930 RR=RR+1
940 CALL HCHAR(RR,RC,PLY)
950 CDE=CD
960 RETURN
970 REM REPAIR SECTION
980 IF (CDE<>HOLE)*(CDE<>REP)THE
N 1040
990 IF CDE=HOLE THEN 1000 ELSE
1050
1000 CDE=REP
1010 FOR T=1 TO 10
1020 CALL SOUND(-199,S,30,S,30,F
R,30,-4,0)
1030 NEXT T
1040 RETURN
1050 IF CDE=REP THEN 1060 ELSE
1040
1060 CDE=RD
1070 IF (RR=11)+(RR=12) THEN 1080
ELSE 1040
1080 CALL HCHAR(RR,RC,CDE)
1090 FOR R=11 TO 12
1100 FOR C=3 TO 29
1110 CALL GCHAR(R,C,TEST)
1120 IF (TEST<>PLY)*(TEST<>RD)*(
TEST<>UTR)*(TEST<>LTR) THEN 1170
1130 NEXT C
1140 NEXT R
1150 REM WINNER***
1160 GOTO 2430
1170 RETURN
1180 REM DAMAGE

```



```

1190 C=INT(RND*22)+5
1200 R=INT(RND*20)+2
1210 CALL GCHAR(R,C,CD)
1220 IF (RR=R)* (RC=C) THEN 720
1230 IF (CD<>RD)*(CD<>UTR)*(CD<>
LTR) THEN 720
1240 IF RND<LEVEL THEN 720
1250 CALL HCHAR(R,C,HOLE)
1260 CALL SOUND(400,-8,0)
1270 IF (CD=UTR)+(CD=LTR) THEN 12
90
1280 RETURN
1290 FOR T2=1 TO 4
1300 FOR T=1 TO 5
1310 CALL SOUND(-99,500+T*20,T*4
)
1320 NEXT T
1330 CALL SOUND(-99,250,12,266,1
0)
1340 NEXT T2
1350 IF CD=LTR THEN 1380
1360 A=1
1370 GOTO 1390
1380 A=2
1390 FOR T=1 TO NUMB(A)
1400 ROW=INT(RT(A,T)/32)
1410 COL=(RT(A,T)/32-ROW)*32
1420 CALL GCHAR(ROW,COL,CD)
1430 IF (CD<>LTR)*(CD<>UTR) THEN
1450
1440 CALL HCHAR(ROW,COL,RD)
1450 NEXT T
1460 ROW=INT(RT(A,1)/32)
1470 COL=(RT(A,1)/32-ROW)*32
1480 CALL HCHAR(ROW,COL,PLY)
1490 GOSUB 1520
1500 RETURN
1510 REM ROUTE TRAFFIC
1520 NUMB(A)=0
1530 IF A=1 THEN 1570
1540 IF A<>2 THEN 1580
1550 TR=LTR
1560 GOTO 1580
1570 TR=UTR
1580 GOTO 1870
1590 CALL KEY(O,K,ST)
1600 CALL HCHAR(ROW,COL,PLY)
1610 CALL HCHAR(ROW,COL,TR)
1620 IF RND<.99 THEN 1640
1630 CALL SOUND(TM,F1,V1,F2,V2)
1640 IF ST<1 THEN 1590
1650 CALL SOUND(100,110,4)
1660 ON POS("ESDX",CHR$(K),1)+1
GOTO 1590,1670,1720,1820,1770
1670 CALL GCHAR(ROW-1,COL,CD)
1680 IF CD<>RD THEN 1590
1690 ROW=ROW-1
1700 CALL HCHAR(ROW,COL,TR)
1710 GOTO 1870
1720 CALL GCHAR(ROW,COL-1,CD)

```

```

1730 IF CD<>RD THEN 1590
1740 COL=COL-1
1750 CALL HCHAR(ROW,COL,TR)
1760 GOTO 1870
1770 CALL GCHAR(ROW+1,COL,CD)
1780 IF CD<>RD THEN 1590
1790 ROW=ROW+1
1800 CALL HCHAR(ROW,COL,TR)
1810 GOTO 1870
1820 CALL GCHAR(ROW,COL+1,CD)
1830 IF CD<>RD THEN 1590
1840 COL=COL+1
1850 CALL HCHAR(ROW,COL,TR)
1860 GOTO 1870
1870 TOT=ROW*32+COL
1880 NUMB(A)=NUMB(A)+1
1890 RT(A,NUMB(A))=TOT
1900 IF (ROW=10+A)*(COL=27) THEN
1920
1910 GOTO 1590
1920 RETURN
1930 CALL CLEAR
1940 PRINT "VICTORIAN SEWERS":;"
(C)1982 STEPHEN SHAW":;
1950 PRINT "YOU MUST KEEP THE CI
TY":;"TRAFFIC FLOWING.":;"DESPITE
THE FREQUENT".
1960 PRINT "COLLAPSE OF SECTIONS
OF ROADS AS THE OLD SEWERS AT LAS
T GIVE IN TO TIME."
1970 PRINT "":;"PRESS ENTER TO CC
NTINUE..."
1980 INPUT A$
1990 CALL CLEAR
2000 PRINT "A MAIN ROUTE RUNS AC
ROSS THE CENTRE OF THE SCREEN.":;
"A LARGE COLLAPSE TAKES PLACE"
2010 PRINT "FIRST YOU MUST REROU
TE EACH OF TWO LANES OF TRAFFIC"
":;"USING THE ARROW KEYS:":;" E.S
.D.& X."
2020 PRINT "YOUR ROUTE MUST NOT
CROSS ANY OTHER ROUTE NOR ANY"
":;"DAMAGED SECTIONS."
2030 PRINT "PLAN YOUR ROUTE BEFO
RE YOU BEGIN AS CORRECTIONS CAN
NOT BE MADE...":;
2040 PRINT "PRESS ENTER TO CONTI
NUE..."
2050 INPUT A$
2060 CALL CLEAR
2070 PRINT "WHEN TWO LANES OF TR
AFFIC HAVE BEEN ROUTED YOU ENT
ER ANOTHER SECTION OF PLAY."
2080 PRINT "YOU MUST MOVE YOUR R
EPAIR GANG (R) USING THE CURSOR
R KEYS AND WHEN OVER DAMAGED
"
2090 PRINT "ROAD, REPAIR IT BY PR
ESSING KEY 'R'."

```



Victorian Sewers

```
2100 PRINT "IT TAKES TWO ENTRIES  
TO REPAIR EACH SECTION."  
2110 PRINT "WHILE YOU ARE DOING  
THIS ":"OTHER SECTIONS COLLAPSE."  
":"IF TRAFFIC FLOW IS HALTED,"  
2120 PRINT "YOU MUST REROUTE THE  
TRAFFIC BEFORE CONTINUING THE RE  
PAIR"  
2130 PRINT "YOU WIN IF YOU CAN R  
ESTORE THE MAIN ROAD."  
2140 PRINT "YOU LOSE IF YOU CANN  
OT ":"RESTORE THE TRAFFIC FLOW ":"  
WHEN IT IS DISRUPTED.":  
2150 PRINT "PRESS ENTER TO CONTI  
NUE"  
2160 INPUT A$  
2170 CALL CLEAR  
2180 PRINT "ENTER DIFFICULTY LEV  
EL ":"1.EASY":"2.MEDIOCRE":"3.AV  
ERAGE":"4.HARD":"5.VERY HARD":"6  
.INSANE"  
2190 PRINT :  
2200 INPUT LEVEL  
2210 IF LEVEL<0 THEN 2180  
2220 IF LEVEL>6 THEN 2180  
2230 LEVEL=LEVEL/7  
2240 CALL CHAR(11?,"FF0181818181  
81FF")  
2250 CALL COLOR(11,10,12)  
2260 CALL COLOR(8,15,15)  
2270 CALL COLOR(10,16,16)
```

```
2280 RANDOMIZE  
2290 HOLE=30  
2300 REP=112  
2310 RD=95  
2320 UTR=104  
2330 LTR=105  
2340 PLY=82  
2350 RR=11  
2360 ROW=11  
2370 COL=9  
2380 RC=9  
2390 CDE=RD  
2400 RT(1,1)=11*32+4  
2410 RT(2,1)=12*32+4  
2420 RETURN  
2430 REM *** WINNER ***  
2440 CALL SOUND(600,300,0)  
2450 PRINT "WELL DONE YOU MADE I  
T!"  
2460 CALL COLOR(8,2,1)  
2470 PRINT "TO PLAY AGAIN CLEAR  
AND RE- RUN PROGRAM"  
2480 GOTO 2480
```

