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## VOLUME 3 NUMBER 10

## FEATURES

• <i>Slimline 64</i>	13
A smart new look for your C64.	
• <i>Killed Until Dead</i>	20
Game of the month.	
• <i>GEOS Expanded</i>	26
The latest GEOS software reviewed.	
• <i>Byting into the 6510</i>	29
Machine Code programming for beginners.	
• <i>Plus/4 Software offer</i>	36
Our latest software for Plus/4 and C16 owners now on cassette.	
• <i>Coin-Op Conversions</i>	82
We look at the latest conversions from the arcades.	
• <i>Programmers Packages</i>	88
Utility software from JCL under the microscope.	
• <i>Tech Drive 64</i>	90
We launch a new software service with a superb driving package.	
• <i>Two from Adamssoft</i>	103
A close look at COBOL and Chartpack for the C64 and C128.	
• <i>Filmaster</i>	107
A cheap database for the C64 and C128.	
• <i>Arcade Action</i>	108
Tony Crosser takes a look at how to move and animate sprites.	
• <i>ED on CP/M</i>	126
Mike Roberts unravels the mysteries of ED on a C128.	

## INSIDE YOUR AMIGA

• <i>Amiga Agony</i>
• <i>Fest Flavouring</i>
• <i>Video Stars</i>
• <i>Sounds Fantastic</i>
• <i>Zing</i>
• <i>Amiga Games</i>
• <i>Executive Amiga</i>

## REGULARS

• <i>Date Statements</i>	5
• <i>IQ</i>	10
Intellectual games playing.	
• <i>School Room</i>	16
Our regular look at educational software.	
• <i>Letters</i>	18
• <i>Contributions</i>	40
How to write for Your Commentors.	
• <i>Games Reviews</i>	49
• <i>Listings</i>	80
How to type in our programs.	
• <i>Competition</i>	86
Win a camera with the Mystery of Arkhian Manor.	
• <i>Software for Sale</i>	101
• <i>Hex Data Entry II</i>	114
• <i>Back Page</i>	130

## GAMES AND UTILITIES

• <i>Utility Commands</i>	22
Add new Basic commands to your C128.	
• <i>Plus/4 and C64 Cruncher</i>	42
Compact and speed up your Basic programs.	
• <i>Programmable Function Keys</i>	94
Make use of the function keys on your C64.	
• <i>Cafe 64</i>	98
A powerful calculator for your C64 at the touch of a button.	
• <i>Diskit 5</i>	105
A machine code to DATA statement converter for the C64.	
• <i>Cross Reference</i>	112
Find out what variables are used where with this handy utility.	
• <i>Suicide Run</i>	117
A superb C64 game to type in.	

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# DATA STATEMENTS

## Adventure line

*Phantasia III - The Wrath of Akodonos* is about to be released in the UK by US Gold. Here is the final confrontation between a band of adventurers and the Dark Lord Nibdonos and his army of horrible creatures.

*Phantasia III* is a multiple character role-playing game wherein players can assemble up to six adventurers. They can choose combinations of the eight races and six classes of character which include humans, elves, dwarves, thieves, warriors and wizards. The characters must use their skills to invade difficult terrain, escape from dragons, destroy demons and finally confront the Dark Lord himself. Over Woggles of monsters must be met in the Mythical dungeons.

The game comes complete with disk, rulebook and data card and will cost £19.99 on the C64/128.

From Granada, there's *MASK* featuring the adventures of Matt Tracker.

A battle between *MASK* agents and the enemy VENOM agents has left the planet battle scarred and almost lifeless. Matt's fellow *MASK* agents are scattered on earth throughout space and time and Matt must save them using his damaged Thunderhawk transporter.

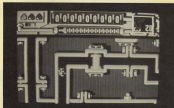
Once Matt has managed to reach earth he faces terrible danger in the shape of flying invaders, runaway trains and live volcanoes. In his quest he must collect items to save his job while avoiding VENOM patrol craft.

*MASK* is the first computer game based on the adventures of Matt Tracker and is due for release in July for the C64.

## Twinkles

ES Game Units 383, Highfield Way, Redford, Stroudham BS 76E. Tel: 071 336 1388.

Granada Alpha House, 18 Currier Street, Sheffield S1 4PS. Tel: 0742 336411.



In The Arcade Style

Granada has bounced back into the arcade game field with two new subbery releases - *Ar-Bounder* and *Thing* bounce back.

*Bounder*, the star of the C64 game *Ar-Bounder*, is a tennis ball that doesn't need a racket. In a 3D world of colourful hexagonal slabs, collapsible floors and high speed bouncing, *Bounder* must hurdle through 18 levels of enemy throated scolding platforms in order to reach the Master Alien. Floors of alloy for his path and a central avatar at the end of each level to provide further problems. *Bounder* can defend himself with fire power and armour plating, to be picked up along the way.

*Thing* on a Spring returns in a sequel entitled *Thing Answers Back*. Flirting with the toy goblin in his first escapade, he must now stop the factory computer which is auto-producing toys.

In his re-programming adventure he can alter the layout of rooms and can travel through the factory pipe network, whilst picking up software to aid his task. Ward goblins lurk in all locations, anxious to deplete *Thing's* oil stocks in order to make his spring seize up.

Available for the C64, *Thing* is in the shops now.

Phantasia has announced a new arcade game for the C64 which will be available in September. The thrilling adventures of *10 Wizards* and *The Sky Vampire* leads us to *Wexos*, a failed accountant and lion tamer, leading vampires with a rapid fire garlic gun.

Attacked by sharp jagged bats, dumb Frankenstein's monsters and dumb She Vampires, *Wexos* is fighting his way through the Vampire's mansion for a confrontation with the Great She Vampire herself.

Arctozoft has finally managed to release *They Seize a Million*, a game originally scheduled for December 1986.

Product Manager Mark Easton said: "We were caught on the job alright, the delay meant an extra three months hard labour for us and plenty of action down the tube on pre-Christmas promotion." The game is now available on the C64/128, on cassette at £9.99 and disk at £14.99.

## Twinkles

Granada Alpha House, 18 Currier Street, Sheffield S1 4PS. Tel: 0742 336411.

Phantasia White Horse Street, London WC2R 2EP. Tel: 01 836 9833.  
Arctozoft 68 Long Acre, London WC2E 6RN. Tel: 01 836 3471.

## D A T A S T A T E M E N T S



The Tube

### Into Space

*Enterprise* is a new release from MuseElectronic in which you, a criminal from Earth, must go and try and make your fortune by trading with the millions of alien in outer space.

However earth's problems of poor economy are common to the other planets in the universe.

*Enterprise* features 3D graphics text communications with alien computers, plus a flight simulator to land on each of the planets. It will be available soon for the C64, priced at £8.99.

In *Zynaps*, a new space shoot 'em up from Hoxson, you must try and escape the horrors of captivity on an alien planet using your skill and lightning reactions to avoid asteroid storms and missiles. Styled in comic book format, the game will be based around chapters and episodes. There are over 450 screens of scrolling action. Your aim is to reach the alien stronghold so the final conflict can begin.

*Zynaps* is priced at £8.95 for C64 cassette and £12.95 for the disk version and the release date is set at June 28.

Another alien sapping game has just been launched by Quicksilver, limited *The Tube*, the game features a complex control panel on the screen at all times to keep you informed about your status' energy, time, distance and shields. It's available on both cassette and disk for the C64 at £8.45 and £12.95 respectively.

### Touchline

**Melbourne House: 8-10 Paul Street, London. Tel: 01 277 6880.**

**Hoxson: Hoxson Music, 565 Millen Trading Estate, Millen, Abingdon, Oxon OX14 4BY. Tel: 0235 839039.**

**Quicksilver Victory House, Leinster Place, London WC2N 7JX. Tel: 01 439 6666.**

### Print Out

Star Microsics has recently launched the ND-13 dot matrix printer.

The new model provides dual printing at 180 characters per second and near letter quality at 40 cps. It has been designed for the budget conscious user and is priced at £499. As with all Star models, the ND-13 features a front panel which takes the drudge out of fiddling with DIP switches for commonly used functions. Via the panel, the user can select print mode (draft or NLQ), choose pitch settings, access the form length control, set margins and carry out several other functions.

Trayless feed and semi-automatic sheet feed are fitted as standard, and an available option is a low cost automatic cut sheet feeder. The front panel also provides forward and reverse micro-feed control.

Also standard is the Star slot-in interface which ensures connection to all major micros.

### Touchline

**Star Microsics, Crown House, 40 Coleridge Road, London W2 2BX. Tel: 01 848 3860.**



### And From US Gold

Activision and Telecommsoft have come to an agreement to release nearly 40 previously full price Activision titles on the Firebird Silver label at £1.99.

Silver Range boss Chris Smith said: "There are some really cracking games here for £1.99. Titles such as *Back to the Future*, *I of the Mask* and *Phylax 1 and 2* head the series." There are also three games brand new to the European market: *Reed Street*, *Parasite* and *Pyromach of Time* for the C64.

*Pack Patrol* for the C64 was recently released under license from Activision on the silver label and was very successful. Rod Coombs of Activision commented: "The success of *Pack Patrol* prompted us to

contemplate the re-release of our back catalogue in the budget sector. Telecommsoft had clearly demonstrated their effectiveness to us, and it made sense to conclude an arrangement which was in the interest of all concerned."

The first titles will be in the shops in the early summer and the rest will follow over the next two years.

There are three new Firebird titles for the C64 already in the shops. *Operator* is a fast shoot'em up in which you have to destroy the alien forces which are terrorizing the earth. The first state involves shooting alien craft while avoiding their fire, while in the second stage you must dodge asteroids in the asteroid minefield. Finally, as

## D A T A S T A T E M E N T S

commander of the Gunstar fleet you must annihilate the alien command ship.

In UFO you must pilot the F21 Condor, the only craft capable of combating the UFOs which are closing in on New York. However, watch your step because the F21 is still experimental and many things could go wrong before you complete your mission.

Finally, as it moves down to earth level, you could choose to guide Gerry the Goron around an unfortunate human's body. Gerry needs to try and cause as much damage as possible, ultimately ending in a beam attack. Is this a tricky 'sick' game?

*Journal Manager*, an addictive game you must surely have heard of, has now been released by Britain as a budget title. If there are any C64, C16 or Plus/4 games who don't possess this all-time favourite, take heart. You can now buy it for just £2.99.



*Indiana Jones - Coming soon.*

### Budget Software



*Budget titles from Players.*

There are two new C64 titles from Mastertronic. *Proxima* is in the £1.99 range and is a 48 level shoot 'em up. *Fortress* is £2.99 and is a Jeff Minter rapping game.

The power House has released *Rescue* for the C16. As C64 owners may know, it's a platform game based on the ancient Greek myths of the 12 labours of Hercules. The price is only £1.99.

Finally, budget software house, Players has come up with affordable disk based software. The two game packs are now in the shops priced at only £4.95 for the C64/128. The first in this range features the two games *Foxy* and *Playgo*.

### Touchline

**Televuegraph: First Floor**, 64-76 New Oxford Street, London WC1A 1AP. Tel: 01 379 4725.

**Polux: Don't I, Royal Road, Enfield, Middlesex EN3 5SA. Tel: 01 804 8700**

**Mastertronic: 8-10 Paul Street, London. Tel: 01 377 8280.**

**The Power House: 264 Weymouth Road, London SW20 8PA. Tel: 01 879 7266.**

**Players: Mercury House, Colindale Park, Aldenham, Bucks MK7 4JW. Tel: 07158 77580.**

US Gold has announced the release of three electronic novels from Bredonburn.

*Underfoot, Exot* and *Arctostone* are all interactive adventures specially written for computers and each comes with its own hard back novel.

*Mindscope* allows you to enter the minds of four deceased geniuses in order to retrieve the Wheel of Wisdom, civilization's only hope of a salvation.

*Exot* is an intergalactic adventure featuring the original Starship Exot. You must lead a mission to save Professor Klein by combating the evil Veldrons in deep space. The survival of the universe is at stake.

Finally, *Arctostone* gives you the opportunity to explore the adventures of the ancient Alishan manuscripts and travel into the underworldly realms of Ulia.

All the novels are disk based and priced at £24.99 for the C64 versions.

Also, we've received news that US Gold is releasing *Indiana Jones* for the C64, a game based on the very popular film featuring the Harrison Ford character. Look out for more news on this.

### Touchline

**US Gold: Unit 2/3 Skelton Way, Redford, Birmingham B26 7AE. Tel: 021 356 1288.**

## DATA STATEMENTS

**Wargaming**

Wargaming seems to be becoming more and more popular with computer game players. Here's a quick rundown of the many new titles available in the coming weeks.

**Cafetal Conqueror** is from US Gold and is a game of world domination for up to six players.

**PSI**, a company specialising in ar simulations is releasing a three game pack priced at £12.95 on cassette and £17.95 on disk for the C64. The games featured in this collection are *Battle of Britain*, *Theatre Europe* and *Fall Gnd 87*.

**SSI**, American based war game house, has announced the forthcoming B24 a World War II simulation of 15 bombing missions over Rangoon. The price of this game in the US is \$24.95.

**Recruitment Program**

It's the time of year when software houses are fighting to snap up bright young programming talent, so look out for the ads.

**Audiogenic** has announced a big incentive to would-be star programmers. Any Audiogenic programmer whose game gets in the Gallup top 10 will be given a Commodore Amiga 500 worth over £200. For a program that reaches the number one spot, there's an Amiga 2000 with a hi-res monitor, worth over £1500. These bonuses are in addition to the normal royalties.

**Audiogenic's Peter Calver** said: "We're looking for top people, not necessarily those who've already made a name for themselves, but the ones who are about to reach their peak."

**Code Masters**, the budget software house has been offering high conversion fees to programmers. Recently the company offered £2000 for a Spectrum version of *Grand Prix Simulator*. Code Masters also needs programmers to convert 12 other titles.

**Code Masters' Jim Darling** said: "We are currently spending in excess of £10,000 converting our titles to other formats. To all intents and purposes our budget for top quality original games is almost unlimited. We are determined to produce games of outstanding quality."

but maybe you should look out for it over here from US Gold in the future.

Also from SSI for the C64 is an American Civil War game entitled *Battle Charge at Chancellorsville*. The game recreates a two day battle which took place in September 1863. It would set you back \$49.95, if you could get across the Atlantic to buy it.

US Gold has also come up with a compilation for the C64. *War Game Greats* features historical battles from World War II in the games *Battle for Normandy*, *Knights of the Drago*, *Combat Leader* and *Tigers in the Snow*. Cassette versions cost £24.99 and the disk version is £29.99.

For those of you having problems with microsoft's *Strike Force Harrier*, help is at hand with the Harrier Hotline on 01 377 4900 or write to the address in Touchline.

**Touchline**

at: 1040 Kensington Ave, Mountain View, CA 95065

PSX: 457 Honey Spenser Road, Cussey, C19 2NG. Tel: 0203 647356.  
C57 Gold: Ours 2/3, Midford Way, Midford, Stroudglosh B6 7AG. Tel: 017 256 1088.

**Microsyn** Harrier Hotline, Maxwell House, 74 Warwick Street, London WC2A 2ZN. Tel: 01 377 4900.

**Robot World**

Now there is a build-your-own-robot kit available which may even prove to be an educational aid for youngsters.

**Arville** is the name of a mini-robot that simulates more sophisticated industrial types. It has been developed by Ostridge Technology of Milton Keynes for use with home computers including the C64.

Supplied in kit form with concise instructions Arville can be assembled in about two hours by anyone who can use a screwdriver and a pair of pliers. Then, it is simply connected to a power pack and the serial port of your C64, the software disk is inserted into the drive and Arville is ready to go.

**Arville's** instruction book is written in standard English and options which appear on your screen guide the user through different sequences so that learning can be achieved easily by practice.

Arville has the ability to pick up and place objects and hold and use tools. Its manipulative arm has a wrist and elbow and a sensitive hand which can grip objects of up to 250gms in weight.

This fascinating robot is priced at £229 and is available from the makers.

**Touchline**

**Ostridge BSA**: Brivditch, Seven Street, Leaford Wood, Milton Keynes MK14 6LD.

**Superior Software** claims to have had a fantastic response to its recent recruitment campaign which involves supplying applicants with a free booklet to put them on the right track.

The author of the book, **Success in Software**, is superior's MD **Richard Hanson**. He said: "So far, we have been receiving an average of 75 replies a day to the advertisements and the feedback from recipients of the booklet has been extremely positive. We have received a number of programs that we intend to launch during the next 18 months, but most importantly, we have found authors for many of our premier 1987/8 projects."

There is still work available from Superior. Copies of the booklet can be obtained by sending details of your abilities to Richard Hanson at the address in our Touchline.

**Touchline**

**Audiogenic 12**: Chilton Enterprise Centre, Station Road, Thame, Berks RG7 4AA. Tel: 0734 626663.

**Code Masters 1**: Rosemont Business Centre, Rosemont Close, Banbury, Oxon OX16 7BT.

**Superior Software**: Keyes House, Sloman Lane, Lechlade, Glos GL7 2JG. Tel: 0352 456455.



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# I.Q.

*If you hate shooting aliens and feel that you need something more intellectual to stimulate your grey matter, then look over this selection of games.*

## I.Q.

**A**n appropriate title for this section of the magazine and a strange game to host. Do you remember the game of dots that you used to play as a kid? A pattern of dots was drawn on a piece of paper and players took it in turns to join two of the dots together. If you completed a square, you could put your initial in it and have another go. I.Q. is a sort of computerised version of boxes.

Instead of having squares to complete, there are hexagons. Each dot is surrounded by six others and if you can complete the shaft of the spikes emanating from a dot, then the territory becomes yours. So far, there is nothing to suggest anything out of the ordinary. What is different about I.Q. is that you can train your playing piece to move round the board for you.

The piece is called a SAM – super artificially intelligent lifeline – and it works as follows. As you make the first few moves, the SAM remembers how it responded in a certain situation. If it encounters the same position again, it will move the same way again. The simplest patterns are straight lines and zig-zags. Your SAM will continue to lay a trail until it



come to a pattern that it does not recognise. You must then input the next move.

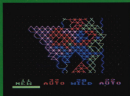
You can play against up to three different opponents, either human or computer. As a new trail is laid to a particular territory, so all the trails in that territory change to that colour. The result is a spectacular blur of changing shapes and shades – a sort of thinking man's Psychoid. If a trail has no exit from a territory, it dies. This is the usual case when two colours are converging on the last two spikes of a territory. When all the trails are dead, the game ends.

I.Q. is a strange, most original game. Initial bewilderment soon turns to fascination but I have considerable doubts as to whether there is any great lasting appeal. There was no competition to try and do that little bit better and work out what the best tactics were – an essential requirement for any strategy game. **G.R.H.**

### Further

Title: I.Q. Machine C64. Supplier: CRL, 9 Acre Yard, Carpenter Road, London E15 3JG. Tel: 01 583 0877.

Originality: 5/10. Graphics: 4/10. Playability: 4/10. Value: 5/10.







## THE DETECTIVE

**A** private investigator expects some peculiar cases from time to time but none were stranger than the MacFungus case. A message is left anonymously that this well known rich scientist has died. The circumstances seem to be decidedly dodgy so you — Inspector Sandoz — decide to investigate.

The Detective is an isom driven graphic adventure. You are free to wander as will reveal MacFungus' huge mansion, the border flashes if there is anything around that may be of interest to you. A quick press of the fire button brings up a series of icons representing your possible actions, which icons appear depend on your situation at the time. For example, the 'question' icon will not appear if there is no one else in the room to talk to.



The other guests in the mansion are the typical selection of wackos found only in wackier movies. A deadly virus, a mad, wired man, type and the inevitable butler who, the old movies insist on, is the one who did the deed or did, or does plural as several other accidents quickly occur. The young lady of the house was seen squashed by a falling piano, obviously playing in the key of A flat minor!

Your first task will be to map the house, although the secret passages may prove tricky. The interaction between you and the guests is minimal and I found it annoying that they would tell me that a murder had been committed but not where. Another example is that when you die the game, the butler says that he will show you to your room and then takes you on a wild goose chase all over the house. Coupla

this with a less than friendly isom system and an abundance of spelling mistakes and the game quickly loses whatever initial appeal it had.

G.R.H.

### *Touchline*

**Title:** *The Detective: Machines, C64, Supplier: Argus Press Software, Victory House, Lakeside Place, London WC2H 7AE, Tel: 01 439 0666*  
**Originality:** 6/10, **Graphics:** 6/10, **Playability:** 4/10, **Value:** 4/10

## THE BIG SLEAZE

**I**n New York in 1930, time of the Great Depression, there was only a job of work available to you if, like Sam Spidek,



you were a real thick, private investigator. Of course, this presupposes that you will of course find something to investigate but the area that you work out on is rough and the chances are you will in all the right places so it shouldn't prove to be too difficult.

Thus, you find yourself in the office waiting for an adventure to happen. Sure enough, two cops suddenly appear. The game would be a bit boring otherwise. A cautious broad has lost her rich daddy and someone else is being blackmailed over a photograph. As both cases come complete with cheques, you are back in business again.

From here, the plot goes rapidly downhill. Written by Ferguson McNeil, author of *The Beggar and Dored of the Kings*, it is one glorious send up from start to finish of every American detective story you have ever read. The atmosphere is rapidly built up and the humour, while not being the sort of thing to draw a murder case, is guaranteed to raise a titter or two.

The game loads in three parts although you will need to complete one part before you are allowed to progress to the next. The game is more than adequate and I couldn't find any examples of obscure vocabulary being used.

As is usual with this type of game, it had flesh to say very much about it without giving away the plot or spoiling the jokes that suffice to say, this is my favourite McNeil narration to date. Go and buy a copy. You won't be able to keep your face straight when watching the Matinee Falcovs ever again.

G.R.H.

### *Touchline*

**Title:** *The Big Sleaze, Machine: C64, Supplier: Pragma Software, 4 Little Essex Street, London EC2A 4EP, Tel: 01 436 9631, Price: 19.95*  
**Originality:** 8/10, **Graphics:** 8/10, **Playability:** 8/10, **Value:** 8/10

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# Slimline 64

*Fed up with the way your C64 looks? Give it a super slimline look with a new case.*

*By Stuart Cooke*

Commodore 64 computers have had the same boring look for a number of years now, only with the recent advent of the 64C has the tried and tested computer had a face lift and been made to look a little more modern.

Owners of what are no doubt grubby, scratched, coffee stained old style cases can now give their C64s a bright new look by replacing the case with Slimline 64 from Evesham Movers.

The case is a straight replacement for the existing one. All of the computer boards being transferred to the new one. If your old case was in the same state as mine then the best place for this is probably the bin.

Fitting the case is simplicity itself and should present no problems to anyone with even a rudimentary knowledge of how to hold and use a screwdriver.

Three screws hold the C64 old style case together, removing these and removing the keyboard connectors from the circuit board splits the case into its two components. The keyboard and circuit board can then be transferred to the new case by simply unscrewing them from the case. Once the in-dot six screws simply hold the new case together.

## Low profile

The Slimline 64 case is a vast improvement on the old case. The keyboard is much lower at the front making it much easier to type on. I hate the high keyboard on the normal C64 and find that it makes my wrists

ache when typing for a long time. I suppose that this is really personal preference but I do like the lower keyboard.

C64 owners that have neon switches and Dolphin Box will be pleased to know that there are holes in the rear of the case ready made for their associated switches. This means that you don't have to get your electric drill out to fit them, and you certainly don't have to have wires hanging out the back like I've seen on many C64's.

The Slimline 64 case is a little wider than a normal case. The area behind the keyboard being lengthened. Be warned, even though this area looks as

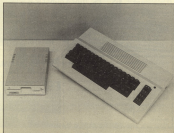
though it might be nice to support your TV etc. on, it isn't as sturdy as it looks as a press on the top of it will show.

The Slimline 64 case is a vast improvement on the old style. It not only looks nicer but does make it a lot more comfortable to use. My only question is, why didn't someone think of it before?

## Finalities

Name: Slimline 64 Supplier: Evesham Movers, 61 Bridge Street, Evesham, Bucks MK11 4SP. Tel: 0296 47993 Machine: C64 Price: £78.95.

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# School Room

*We bring you the latest in educational software to make these exams just that little bit easier.*

*By Margaret Webb*

**T**his month I will be looking at two different sets of disk based educational software, each with its own characteristics and merits.

The first set come from Cronos Software, a small company based in Droickick and comprised of two mathematics programs aimed at opposite ends of the age spectrum.

*Maths Test* sets out to help the junior school child to manipulate numbers and arithmetical operations. The program is set out as a board game and the child must get the best score to win. The idea of the game is to beat your opponent and to get from the start to one hundred before he does. The opponent can be either the computer or another human. In a manner similar to snakes and ladders the game allows you to send your opponent back squares by landing on him and to move forward by landing on a designated number. Skill is a major factor in this game. The computer generates three numbers (all less than 10) and the player must use the numbers in the order given along with the arithmetic operators (each only once) to generate a sum. The idea is to create the sum which will give you the most advantages, although not necessarily the highest, score. The game does have an additive quality but is a little dull in presentation. More development of the graphics is really necessary to give a product which will appeal to children.

The second program, *Accounting Part 1*, is, as its title suggests, an accounting tutorial. It is aimed at 'O' and 'A' level students and those taking other similar examinations. The program acts as a simple teaching and offering reviews and self tuition. In context, you get a series of pages of information interspersed with test questions which check your grasp of the material. While the program will operate on its own, it is probably best used with an appropriate text book.

Overall, these offerings from Cronos are adequate in content but they do have a couple of faults. First,

they aren't too exciting in their presentation. Computer users are becoming choosier nowadays and expect more sophisticated graphics. Because of the small market for educational software, software houses must pull out all the stops when preparing programs. The Amstrad products and many of those on the BBC have shown what can be done.

Secondly, the amount of material on the disks didn't really represent good value at £7.95. I would expect at least two programs of the size of *Maths Test* for that price. With budgets being so small, schools will only buy software which gives them value for money.

Both of these faults can be easily rectified and I look forward to seeing what Cronos come up with in the future.

The second offering, *grammar guide* a contract, School Software, a company based in Linsick, offers a range of software for the BBC, Amstrad and 64 and, from what I have seen, it's quite messy in content.

A wide range of subjects are covered, four of which fall through my letter box. All of the programs seem to have the similar format of optional study notes combined with test questions. This allows you to decide whether you are learning or revising. Inevitably, the content is too cursory to provide sufficient detail for written exam answers and the simultaneous use of test banks is mandatory.

*Better Spelling* is aimed at the right to adult range. This program overcomes some of the problems discussed in this column in the October issue of *Four Computers and Success* in teaching the subject quite well. There is a menu of 16 items to choose from, each dealing with a specific area. Such subjects as phrases, prefixes, silent E, tenses, particles etc. are covered in a first group of nine options. In these options, you must type in the required word. A second group of seven options covers common spelling errors. This time you

must fill in the gap in a sentence. For example, the use of he, two and too is covered as is been and being. Each test ends with a score of your performance and the option to make a hard copy of your results. Some effort has gone into making the program attractive with the same graphical effects but it's still not quite there.

The other three packages were *Physical Geography*, *Map Work* (Britain and Ireland) and *Physics 1*. All were suitable for ages for 12 years upwards. These packages are again split into a number of sections covering various topics within each subject. The use of graphics is much more in evidence and is of a better standard.

All of the School Software programs are of a decent length and give you plenty to do. I cannot comment on their value for money since the software I was sent didn't have any prices (it did, however, have an order form). They are, however, good quality products which perform their purpose well.

To some extent, these packages epitomise the problem with writing software for education. On the one hand, you must have input from the teachers so that the content and method of presentation of the material is sound. And, on the other hand, you must have the ability and creativity of the programmer to ensure that an attractive and efficient program is prepared. While all of the programs discussed score quite well in the first area, they don't all do so well in the second. I feel that perhaps Cronos should particularly note this.

Notwithstanding this caveat, these products will teach you and they are quite well against the opposition. **BT**

## FOURCOMING

Cronos Software, PO Box 8, Droickick, Droickick L39 5JHE. School Software Ltd, 49, Meadowdale, Rahara, Droickick, Ireland. Tel: 045-37994.

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# Letters

*If there's anything you want to know or anything you want to say, just write it to this page and we'll try and oblige.*

## Printing cost

Many people brag about the facilities provided by their printers, but little is said about its running costs.

These days, you might easily buy a bargain printer, only to discover that you have to pay through the nose for paper and cartridges.

If you can't find a model which also prints money, perhaps you should consider the following money saving advice.

Firstly, if you are planning to buy a printer, look for one which accepts ordinary paper; printed paper can be two or three times as expensive. In this respect, the Commodore MPS 860 is a good buy, even though its reputation is not great.

Once you've got a printer which accepts single sheets, you can save a fortune on those expensive cast-rodgers by using carbon paper, as you would on a typewriter. Simply use the top page over and over again as you print straight on to the carbon paper. In this way, you can have up to 40 pages of excellent printout on one page of carbon paper, saving a couple of pence.

Finally, for run-of-the-mill printouts like listings, use photostating paper which you can get for around £2 for 1000 sheets.

B. Henry Lohman, London.

## Cheap and Cheer

I thought I would write and let other readers know about a nice little money that certain people have hit upon.

There are a few companies that are all concerned that it's great way of writing on both sides of a 1541 5 $\frac{1}{4}$  disk. They say it will fit in the 1541 ignore the usual write tabs, the unpunched edge of the disk, and indeed it does do this.

The companies are asking £4 and in return they will send you the parts and instructions on how to do this.

I already knew this procedure and what parts were needed, however, I thought I'd write off just to find out what was going on.

For £4 I received a 20p machine and the directions on how to fit it.

I'd like to inform other Your Commodore readers of this tip off and make my own offer. If anyone wants this

information free, then all they need to do is send me a stamped addressed envelope and I will supply the information. Please remember the s.a.s.c. as I am unemployed and cannot afford the postage.

James Strange, 663 Ashton Hill Lane, Draybale, Manchester M18 6FH.

## Dumpees Delight

Congratulations, Your Commodore and especially Mike Henley, for the Plus4 Dumper program which appeared in a recent issue.

I actually wrote to the editorial department a short while ago requesting just such a program to dump the hi-res screen but to an MPS 860 printer. It works very well and required only one small alteration to make the text dump work also. Many thanks.

I would like to ask if there is any way to make the 860 double strike when printing text? Just the ability to double line feed would do the trick. I can't find a way but perhaps one of Your Commodore's expert readers knows how to do it. E.A. Laurent, Chesham.

As far as we know, it is not possible to get double strike on an MPS 860 because the printer has no auto line feed. We're glad that everybody has found the Plus4 Dumper program so useful. If you are interested in seeing a particular type of program published, then please drop us a line with your ideas. We'll do our best to oblige but we can't promise anything.

## Note

As the Your Commodore office we receive hundreds of letters from readers every month. We do try and answer each individually but sometimes this is impossible due to pressure of work. If you have written to us and not received a personal reply, we apologise for this but we cannot promise to reply to every item of mail we receive. If you feel that your question or letter really needs an answer, then inclusion of an s.a.s.c. will guarantee a reply, although this may still take time to arrive.



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# Killed Until Dead

*Getting fed up of watching Agatha Christie and Dorothy Sayers mysteries on the box? Have a go at the latest Accolade game and see how hard it really is to be a super sleuth.*

*By Anthony Heath*



**F**ive of the world's top crime writers are gathered at the Glasgow Hotel for a festival of murder and mystery. You are Hercule Poirot, the world's greatest detective and it's your job to prevent one of the writers committing murder.

A total of 21 cases are included in Accolade's whodunnit thriller to give you the toughest challenges of your career. Like the other Accolade games, such as *Football* and *Pin-Fooding Company*, the game runs quality with a detailed graphics and joystick controls to ease the steering. Your first case opens with a series of your desktop. In front of you are your files on each of the main suspects, an electronic notebook to record your findings, a phone to call up and question the five members of the Midnight Murder Club and your surveillance team that allows you to break into suspects' rooms, and monitor and tape conversations in the hotel's rooms. One thing is certain that in just 12 hours, at midnight, someone will be killed and dead.

A quick flip through your files will reveal the case charts written of the infamous files and a few suspects that may or may not be important in the case. For example, will it help you to track down the murderer, his or her intended victim, the weapon, location and motive if you know that Sydney MacArthur has more chess than the Hong Kong philosopher, or that Claudia Von Balow is a part time chessplayer. Lord Peter Wimsey was a spectator on the playing fields of Eton, Agatha Marjorie wrote the play *The Learning Trap* or that Miss Marple's favourite hobby is chessing pats. This information may highlight some differences and similarities but will they lead to murder?

The investigation proper gets underway as you attempt to break into the suspects' rooms to look for clues. Tegen into a room they have to be out and you have to manually answer a number mystery crime questions. These only have four possible answers so if you get it wrong, you'll have more

chances next time. Unfortunately, you'll have to wait 10 game minutes to try again as a guard is hanging around the door. Inside the room you'll find the odd clue mixed with a healthy helping of red herrings and perhaps a note the suspect has made about the time and place of a meeting.

Now you must either monitor those meetings yourself or set up your tape surveillance to record them and gather more clues from their conversations. At last, you should be on the trail and it's time to question the suspects. Murder suspects aren't particularly chatty folk and so you must coax them into talking to you by selecting the correct fact about them from the list of four presented to you. Get it right (you'll probably discover the sordid details from the break in) and you can ask key questions about who they think is in danger, who is the killer, where the murderer will take place and what the weapon will be. You can tell whether you're on the right track by the suspects' reaction. If they get worried, then you should start listening. Keep the pressure on and you could find the solution. Finally, you should consult your notes that keep track of break ins, phone conversations, recorded meetings and random tip-offs and then confront the would be killer with the facts and the most likely motive and another case will be solved.

Unfortunately, it isn't that easy. In the harder cases some suspects know nothing at all, others lie and in one case I had calculated that Agatha was about to be gassed down because she had absconded with the proceeds from a robbery, only to find that she gave the money back just before I was about to make my triumphant accusation. By the time it was too late to track down the real killer and the



doomed victim.

Five candidates for both murderer and victim, five weapons and nine locations provide plenty of permutations for the mystery so it's unlikely you'll solve any by chance and means it'll keep you scratching to the very last case. **D**

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*Murder by Numbers* **Digital** *Deadly Deeds: Supplies Available* (UK: Gold, Game 2), *Halford Way, Weyford, Stroudhampton BS7 7AJ, Tel: 017 536 3388.*

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# Utility Commands

*This program supplies 128 users with many of the vital  
commands missing from Basic 7.0.*

*By Nagl Kaufman*

**W**hen I first acquired my Commodore 128 with its great Basic 7.0, I thought that this was the Basic interpreter I had been looking for (compared to my old C64 Basic). However, studying the various commands and all their options, I discovered that Commodore had missed a small section of commands which are indispensable to the programmer. For example, the FIND routine which is very important in some programs, was excluded. Also omitted was the MERGE routine to combine programs from disk, not forgetting the OLD, somewhat known as the UNSW routine. And last but not least, that unknown RKill command which compresses your program by deleting all unnecessary spaces and REMarks.

Since all these valuable commands were not included, the only thing left

for me to do was to write them myself. I have actually managed to write a program which doesn't interfere with my Basic program, while still being active all of the time.

Of course it had to be in machine code but it also had to be accessible as a Basic command. I used the ERROR VECTOR which is located at \$0300 and pointed it to my own routine, which then checks the INPUT BUFFER at \$0200 if one of my commands has been entered. If not it simply returns to the original ROM routine and outputs the error. If one of the new commands has been typed then control is passed to the correct routine.

## In Detail

Let's get down to details. When control is passed to the FIND routine, it first checks if there is any string given

for which it should search. If not the routine outputs SYNTAX ERROR. If the string is given, then the routine compares the program to the string and, if it is found, the line is fixed. The Syntax for FIND is:

```
FIND = statement - - for strings  
which are not in quotes and  
FIND " " statement - - for strings  
which are in quotes.
```

Note: Anything which is after the first quote is included in the statement even if it is a quote.

When you are searching you can use a "wildcard" if you don't know what character should come in that place or if you are searching for different words. The "wildcard" cannot be used in commands since these are tokenized. The "wildcard" is usually the left arrow key but it can be changed to

any other character in the Basic Loader or in the Assembler/Editor listing.

Here are some examples:

```

FIND      Finds all occurrences of the
GETKEY)  GETKEY command.
FIND A$:  Finds all occurrences of the
          variable A$.
FIND     Finds all occurrences of the
"basic"   word BASIC in quotes.
FIND A$:  Finds all occurrences of any
          string-variable that
          starts with an A-;: AA$,
          AB$, AD$, etc.
FIND     Finds all occurrences of
"HELL"   words in quotes like
          "HELLO", "HALLO",
          "SHILLY", etc.

```

The MERGE routine also checks the INPUT BUFFER for a name if it is not given or it is given a wrong syntax, then the corresponding error is printed. The routine works by reading in one line at a time, storing it in the INPUT BUFFER and then using the ROM routine to insert the line into your current program. Its other words the routine acts as if lines are inputted from the keyboard, but reads them from disk. Syntax of the MERGE command is:

```
MERGE "filename" "
```

Note: The second quote does not have to be entered. The length of the filename must not exceed 16

characters. Example:

```

MERGE "SETUP": merges the file
"SETUP"
MERGE "": merges the first file on
disk.

```

The easiest command is OLD. When this routine is executed the pointers at the beginning of the Basic program, which are set to zero after a NEW command, are set to a non-zero number. Then a ROM routine is used to exclude all the Basic program. The end of the program is calculated and then a CLR is performed. The syntax is:

```
OLD
```

Note: No parameters are needed!

Now comes the REKL command. This routine, like the MERGE routine, takes quite a lot of time to finish. This is because the whole Basic program is re-created by using the same REKL routine on the MERGE command. All the unnecessary spaces and REMarks are deleted out of the line and it is then entered. Its syntax is:

```
REKL
```

Note: No parameters are needed!

## Entering The Program

I have included two listings. One is a

Basic loader and the other is an assembler/inline listing.

In the Basic loader the machine code is entered as DATA statements and, at the end of each line, there is a checksum which should prevent typing mistakes.

First you are asked to enter the start location where the program should reside. It is usually located at \$100 through \$400. This is memory that the Basic Interpreter doesn't use and unless you are certain that there is enough space elsewhere (apparently 8000 bytes), the start location shouldn't be changed.

If, however, the program is reentered to another memory location, the Basic loader reports all vectors to the correct location. You are then asked if you want to change the "wildcard" used by FIND() and whether you want to reinit the command.

The Basic loader then asks you if you want to save it. If yes, then enter the filename you want to use. When you have a copy of the machine code on disk you can load and initialize it immediately with the BOOT command (enter BOOT" <filename" >).

The assembler/inline listing is for use with the assembler program found in *Low Commodore July/September 1987* issue called Assembler 128. I have included many remarks in that listing for any advanced programmer.

PROGRAM: UTILITY COMMAND		
10 PRINT "CLEAR", CHR\$(14); "	130 PRINT "%s L%04d" : GOTO 140	200 POKE DEC("B0") : LOC, H=DEC("B0")
20 LOC=100 : GOTO 100	140 NEXT	210 POKE DEC("B0") : LOC, L=DEC("B0")
30 LOC=100 : GOTO 100	150 IF LOC=DEC("1000") : GOTO 200	220 POKE DEC("B0") : LOC, H=DEC("B0")
40 PRINT "NAME" : GOTO 50	200 SET SET JUMPS AND PRINTERS I	230 POKE DEC("B0") : LOC, L=DEC("B0")
50 BY GOTO 60 : GOTO 60	210 CORRECT LOCATION	240 POKE DEC("B0") : LOC, L=DEC("B0")
60 PRINT "NAME" : GOTO 70	220 IF NOT LOC=DEC("1000") : GOTO 230	250 POKE DEC("B0") : LOC, H=DEC("B0")
70 PRINT "NAME" : GOTO 80	230 POKE DEC("B0") : LOC, L=DEC("B0")	260 POKE DEC("B0") : LOC, L=DEC("B0")
80 PRINT "NAME" : GOTO 90	240 POKE DEC("B0") : LOC, H	270 POKE DEC("B0") : LOC, H
90 PRINT "NAME" : GOTO 100	250 POKE DEC("B0") : LOC, L=DEC("B0")	280 POKE DEC("B0") : LOC, H=DEC("B0")
100 PRINT "NAME" : GOTO 110	260 POKE DEC("B0") : LOC, L=DEC("B0")	290 POKE DEC("B0") : LOC, H=DEC("B0")
110 PRINT "NAME" : GOTO 120	270 POKE DEC("B0") : LOC, H	300 POKE DEC("B0") : LOC, L=DEC("B0")
120 PRINT "NAME" : GOTO 130	280 POKE DEC("B0") : LOC, L=DEC("B0")	310 POKE DEC("B0") : LOC, H=DEC("B0")
130 PRINT "NAME" : GOTO 140	290 POKE DEC("B0") : LOC, L=DEC("B0")	320 POKE DEC("B0") : LOC, L=DEC("B0")
140 PRINT "NAME" : GOTO 150	300 POKE DEC("B0") : LOC, H	330 POKE DEC("B0") : LOC, L=DEC("B0")
150 PRINT "NAME" : GOTO 160	310 POKE DEC("B0") : LOC, L=DEC("B0")	340 POKE DEC("B0") : LOC, H=DEC("B0")
160 PRINT "NAME" : GOTO 170	320 POKE DEC("B0") : LOC, L=DEC("B0")	350 POKE DEC("B0") : LOC, L=DEC("B0")
170 PRINT "NAME" : GOTO 180	330 POKE DEC("B0") : LOC, H	360 POKE DEC("B0") : LOC, L=DEC("B0")
180 PRINT "NAME" : GOTO 190	340 POKE DEC("B0") : LOC, L=DEC("B0")	370 POKE DEC("B0") : LOC, H=DEC("B0")
190 PRINT "NAME" : GOTO 200	350 POKE DEC("B0") : LOC, L=DEC("B0")	380 POKE DEC("B0") : LOC, L=DEC("B0")
200 PRINT "NAME" : GOTO 210	360 POKE DEC("B0") : LOC, H	390 POKE DEC("B0") : LOC, L=DEC("B0")
210 PRINT "NAME" : GOTO 220	370 POKE DEC("B0") : LOC, L=DEC("B0")	400 POKE DEC("B0") : LOC, L=DEC("B0")
220 PRINT "NAME" : GOTO 230	380 POKE DEC("B0") : LOC, H	410 POKE DEC("B0") : LOC, H=DEC("B0")
230 PRINT "NAME" : GOTO 240	390 POKE DEC("B0") : LOC, L=DEC("B0")	420 POKE DEC("B0") : LOC, L=DEC("B0")
240 PRINT "NAME" : GOTO 250	400 POKE DEC("B0") : LOC, L=DEC("B0")	430 POKE DEC("B0") : LOC, H=DEC("B0")
250 PRINT "NAME" : GOTO 260	410 POKE DEC("B0") : LOC, L=DEC("B0")	440 POKE DEC("B0") : LOC, L=DEC("B0")
260 PRINT "NAME" : GOTO 270	420 POKE DEC("B0") : LOC, H	450 POKE DEC("B0") : LOC, L=DEC("B0")
270 PRINT "NAME" : GOTO 280	430 POKE DEC("B0") : LOC, L=DEC("B0")	460 POKE DEC("B0") : LOC, L=DEC("B0")
280 PRINT "NAME" : GOTO 290	440 POKE DEC("B0") : LOC, H	470 POKE DEC("B0") : LOC, L=DEC("B0")
290 PRINT "NAME" : GOTO 300	450 POKE DEC("B0") : LOC, L=DEC("B0")	480 POKE DEC("B0") : LOC, L=DEC("B0")
300 PRINT "NAME" : GOTO 310	460 POKE DEC("B0") : LOC, H	490 POKE DEC("B0") : LOC, L=DEC("B0")
310 PRINT "NAME" : GOTO 320	470 POKE DEC("B0") : LOC, L=DEC("B0")	500 POKE DEC("B0") : LOC, L=DEC("B0")
320 PRINT "NAME" : GOTO 330	480 POKE DEC("B0") : LOC, H	510 POKE DEC("B0") : LOC, L=DEC("B0")
330 PRINT "NAME" : GOTO 340	490 POKE DEC("B0") : LOC, L=DEC("B0")	520 POKE DEC("B0") : LOC, L=DEC("B0")
340 PRINT "NAME" : GOTO 350	500 POKE DEC("B0") : LOC, H	530 POKE DEC("B0") : LOC, L=DEC("B0")
350 PRINT "NAME" : GOTO 360	510 POKE DEC("B0") : LOC, L=DEC("B0")	540 POKE DEC("B0") : LOC, L=DEC("B0")
360 PRINT "NAME" : GOTO 370	520 POKE DEC("B0") : LOC, H	550 POKE DEC("B0") : LOC, L=DEC("B0")
370 PRINT "NAME" : GOTO 380	530 POKE DEC("B0") : LOC, L=DEC("B0")	560 POKE DEC("B0") : LOC, L=DEC("B0")
380 PRINT "NAME" : GOTO 390	540 POKE DEC("B0") : LOC, H	570 POKE DEC("B0") : LOC, L=DEC("B0")
390 PRINT "NAME" : GOTO 400	550 POKE DEC("B0") : LOC, L=DEC("B0")	580 POKE DEC("B0") : LOC, L=DEC("B0")
400 PRINT "NAME" : GOTO 410	560 POKE DEC("B0") : LOC, H	590 POKE DEC("B0") : LOC, L=DEC("B0")
410 PRINT "NAME" : GOTO 420	570 POKE DEC("B0") : LOC, L=DEC("B0")	600 POKE DEC("B0") : LOC, L=DEC("B0")
420 PRINT "NAME" : GOTO 430	580 POKE DEC("B0") : LOC, H	610 POKE DEC("B0") : LOC, L=DEC("B0")
430 PRINT "NAME" : GOTO 440	590 POKE DEC("B0") : LOC, L=DEC("B0")	620 POKE DEC("B0") : LOC, L=DEC("B0")
440 PRINT "NAME" : GOTO 450	600 POKE DEC("B0") : LOC, H	630 POKE DEC("B0") : LOC, L=DEC("B0")
450 PRINT "NAME" : GOTO 460	610 POKE DEC("B0") : LOC, L=DEC("B0")	640 POKE DEC("B0") : LOC, L=DEC("B0")
460 PRINT "NAME" : GOTO 470	620 POKE DEC("B0") : LOC, H	650 POKE DEC("B0") : LOC, L=DEC("B0")
470 PRINT "NAME" : GOTO 480	630 POKE DEC("B0") : LOC, L=DEC("B0")	660 POKE DEC("B0") : LOC, L=DEC("B0")
480 PRINT "NAME" : GOTO 490	640 POKE DEC("B0") : LOC, H	670 POKE DEC("B0") : LOC, L=DEC("B0")
490 PRINT "NAME" : GOTO 500	650 POKE DEC("B0") : LOC, L=DEC("B0")	680 POKE DEC("B0") : LOC, L=DEC("B0")
500 PRINT "NAME" : GOTO 510	660 POKE DEC("B0") : LOC, H	690 POKE DEC("B0") : LOC, L=DEC("B0")
510 PRINT "NAME" : GOTO 520	670 POKE DEC("B0") : LOC, L=DEC("B0")	700 POKE DEC("B0") : LOC, L=DEC("B0")
520 PRINT "NAME" : GOTO 530	680 POKE DEC("B0") : LOC, H	710 POKE DEC("B0") : LOC, L=DEC("B0")
530 PRINT "NAME" : GOTO 540	690 POKE DEC("B0") : LOC, L=DEC("B0")	720 POKE DEC("B0") : LOC, L=DEC("B0")
540 PRINT "NAME" : GOTO 550	700 POKE DEC("B0") : LOC, H	730 POKE DEC("B0") : LOC, L=DEC("B0")
550 PRINT "NAME" : GOTO 560	710 POKE DEC("B0") : LOC, L=DEC("B0")	740 POKE DEC("B0") : LOC, L=DEC("B0")
560 PRINT "NAME" : GOTO 570	720 POKE DEC("B0") : LOC, H	750 POKE DEC("B0") : LOC, L=DEC("B0")
570 PRINT "NAME" : GOTO 580	730 POKE DEC("B0") : LOC, L=DEC("B0")	760 POKE DEC("B0") : LOC, L=DEC("B0")
580 PRINT "NAME" : GOTO 590	740 POKE DEC("B0") : LOC, H	770 POKE DEC("B0") : LOC, L=DEC("B0")
590 PRINT "NAME" : GOTO 600	750 POKE DEC("B0") : LOC, L=DEC("B0")	780 POKE DEC("B0") : LOC, L=DEC("B0")
600 PRINT "NAME" : GOTO 610	760 POKE DEC("B0") : LOC, H	790 POKE DEC("B0") : LOC, L=DEC("B0")
610 PRINT "NAME" : GOTO 620	770 POKE DEC("B0") : LOC, L=DEC("B0")	800 POKE DEC("B0") : LOC, L=DEC("B0")
620 PRINT "NAME" : GOTO 630	780 POKE DEC("B0") : LOC, H	810 POKE DEC("B0") : LOC, L=DEC("B0")
630 PRINT "NAME" : GOTO 640	790 POKE DEC("B0") : LOC, L=DEC("B0")	820 POKE DEC("B0") : LOC, L=DEC("B0")
640 PRINT "NAME" : GOTO 650	800 POKE DEC("B0") : LOC, H	830 POKE DEC("B0") : LOC, L=DEC("B0")
650 PRINT "NAME" : GOTO 660	810 POKE DEC("B0") : LOC, L=DEC("B0")	840 POKE DEC("B0") : LOC, L=DEC("B0")
660 PRINT "NAME" : GOTO 670	820 POKE DEC("B0") : LOC, H	850 POKE DEC("B0") : LOC, L=DEC("B0")
670 PRINT "NAME" : GOTO 680	830 POKE DEC("B0") : LOC, L=DEC("B0")	860 POKE DEC("B0") : LOC, L=DEC("B0")
680 PRINT "NAME" : GOTO 690	840 POKE DEC("B0") : LOC, H	870 POKE DEC("B0") : LOC, L=DEC("B0")
690 PRINT "NAME" : GOTO 700	850 POKE DEC("B0") : LOC, L=DEC("B0")	880 POKE DEC("B0") : LOC, L=DEC("B0")
700 PRINT "NAME" : GOTO 710	860 POKE DEC("B0") : LOC, H	890 POKE DEC("B0") : LOC, L=DEC("B0")
710 PRINT "NAME" : GOTO 720	870 POKE DEC("B0") : LOC, L=DEC("B0")	900 POKE DEC("B0") : LOC, L=DEC("B0")
720 PRINT "NAME" : GOTO 730	880 POKE DEC("B0") : LOC, H	910 POKE DEC("B0") : LOC, L=DEC("B0")
730 PRINT "NAME" : GOTO 740	890 POKE DEC("B0") : LOC, L=DEC("B0")	920 POKE DEC("B0") : LOC, L=DEC("B0")
740 PRINT "NAME" : GOTO 750	900 POKE DEC("B0") : LOC, H	930 POKE DEC("B0") : LOC, L=DEC("B0")
750 PRINT "NAME" : GOTO 760	910 POKE DEC("B0") : LOC, L=DEC("B0")	940 POKE DEC("B0") : LOC, L=DEC("B0")
760 PRINT "NAME" : GOTO 770	920 POKE DEC("B0") : LOC, H	950 POKE DEC("B0") : LOC, L=DEC("B0")
770 PRINT "NAME" : GOTO 780	930 POKE DEC("B0") : LOC, L=DEC("B0")	960 POKE DEC("B0") : LOC, L=DEC("B0")
780 PRINT "NAME" : GOTO 790	940 POKE DEC("B0") : LOC, H	970 POKE DEC("B0") : LOC, L=DEC("B0")
790 PRINT "NAME" : GOTO 800	950 POKE DEC("B0") : LOC, L=DEC("B0")	980 POKE DEC("B0") : LOC, L=DEC("B0")
800 PRINT "NAME" : GOTO 810	960 POKE DEC("B0") : LOC, H	990 POKE DEC("B0") : LOC, L=DEC("B0")
810 PRINT "NAME" : GOTO 820	970 POKE DEC("B0") : LOC, L=DEC("B0")	1000 POKE DEC("B0") : LOC, L=DEC("B0")
820 PRINT "NAME" : GOTO 830	980 POKE DEC("B0") : LOC, H	
830 PRINT "NAME" : GOTO 840	990 POKE DEC("B0") : LOC, L=DEC("B0")	
840 PRINT "NAME" : GOTO 850	1000 POKE DEC("B0") : LOC, L=DEC("B0")	



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# GEOS Expanded

*Berkeley Software has now produced an improved version of GEOS plus some utilities packages to complement the system. We put them through their paces and found them very impressive.*

*By Tony Hetherington*



Writer's Workshop



Print Shop - Calendar

When California-based Berkeley Software's launched Geos (The Graphic Environment Operating System) on an unsuspecting world it was met with wild enthusiasm as CMM users flocked to Mac-like icons, pull-down menus and trash cans.

Unfortunately, the standard Geos disk contained only limited software to use these icons and menus and so the enthusiasm waned and Geos gathered dust. Was an operating system that was to be bundled with the Mac designed for obscurity as users returned to less friendly but practical programs? Not just as all seemed lost, Berkeley has released an updated version of Geos and three new packages to put Geos to work.

Writer's Workshop not only replaces the weak geosWrite with a full

wordprocessor but also includes an intelligent mail merge program and text grabber so you can read documents created by other word processors. *Printpack 1* includes 28 new fonts to liven up your letters, *geosDesk* adds a card index system and *DrawPack 1* includes a graphics painter that can "draw" Print Shop, Print Master and Netscape artwork, an icon editor, calendar and dashboard program and finally *Blackjack*.

## Writer's Workshop

Like all the utilities, *Writer's Workshop* is supplied on disk, along with an excellent manual complete with notes to follow worked examples in a box, proudly displaying Mac-like screenshots. Before you can use the

new utilities they must be installed on a work disk. Installing a new program (usually means copying over the file and including its icon into your work disk but for *Writer's Workshop* you must first key it into your *GEOS* master. Once this is done, the *Writer's* disk is permanently linked to the master and cannot be run without the correct master disk.

*Geometric 2.0* is a full wordprocessor that replaces the text handler included on the original *GEOS* disk. Standard word processing features such as double spacing, paragraph settings, headers and footers, search and replace, left, right and full justification as well as plain, bold, underline, strike, outline, subscript and superscript text styles are now available through pull-down





GeoDraw

notes on single key commands. However, you can also change a single word's font or paragraph's font or style by just clicking it. You can format paragraphs using a joystick and print some or all of a document in rough or letter-quality modes.

The problem with using a new wordprocessor is that your old but still important documents are now useless as they were written by other incompatible programs. Thanks to the text grabber utility supplied on the Worktop disk, geoWrite 2.0 becomes the "universal" wordprocessor as it can read and convert any data file into a geoWrite 2.0 document.

Using the text grabber is simple, particularly if the document you want to convert was created using either MacWrite, SpeedWrite or PipeWrite, as a simple selection completes the whole process in a few minutes. Any other CH document can be converted but you will then have to reformat the document.

No wordprocessor would be complete without a mailmerge program to create personalised letters from a single document. GeoMerge takes this one stage further as the original document can contain H and F, ELSE conditions. Depending on key data held in a standard address file the document, these conditions can be used with the results printing or not printing words or sections of text.

#### GeoDesk

The GeoDesk disk not only contains a copy of geoMerge but also an electronic card index system that appears in graphics 3D once the program is loaded. By clicking one of the letter tabs that are arranged at the



Graphics Grabber

top of the cards that record is brought to the front and can be read, edited or used to create a new record.

Each record card contains a small but useful amount of information such as the person's name, address, phone number as well as a single line for added notes.

Down the side of the cards are a series of icons that lead to other options such as geoMerge, delete records, print some or all records either as address labels or just a list of phone numbers, search for a record, view a specific group or unsorted any number as long as you have a modem.

#### Fontpack 1

Fontpack 1 contains the files for 26 new typefaces that can be used to add a

flourish of style to a geoWrite or geoPaint document.

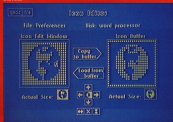
Unfortunately, GEOS can only use seven fonts at any one time and each one must be individually copied to a work disk. If you want a different selection of fonts you have to copy others over to your work and re-arrange the desktop so that the seven you need appear before those you don't want.

#### Desk Park 1

This pack of utilities contains a graphics grabber, text editor, date book and calendar program and another Mac tradition, Blackjack.

The graphics grabber is a spectacular utility that not only adds tremendously to the usefulness of

Icon Editor



GEOS but also extends the flexibility of the productivity programs *Print Shop*, *Print Master* and *Newsroom*. Although fun to use, these programs have serious restrictions limiting the positioning of graphics and size and style of text. By using the text generator GEOS can "read" any *Print Master*, *Print Shop* or *Newsroom* graphic and store it in a photo-clipart album. This can then be placed by *geoPaint* and used by *geoWrite* to create incomparable results.

The text editor may at first sight be just a way to customize your work disk by redesigning the desk top screen but it has a more serious application. Using this or any new GEOS programs can be converted to GEM format, given a GEMS header, an icon and run from the deskTop by simply clicking the icon (this is the equivalent of LOAD ???).B.B).

The datebook and calendar desktop accessories will organize you by providing a 999 year calendar that displays a month at a time on the screen. Any important dates are not only flagged by an asterisk but also link off to a page opened in a datebook.

The pages take up a full screen and can be used to store appointments and reminders.

The final program included in *Desk Pack 1* provides some light relief and is an icon driven Mac like version of *Fun From Blackbox*.

### GEOS Updates

To add to the evolution of innovation and file copying, each disk (except the floppy) contains an updated version of the desktop (version 1.1), new input drivers to support the Koala Pad and some mice, although not the *View Home* handled with the 64C, *geoWrite 1.1* which is basically the original text handler with single key commands and a slightly improved version of *geoPaint*.

### Conclusions

These three new utilities and first *Desk Pack* add a new lease of life to the Maclike operating system GEOS. Although each pack has something new to offer I found the text and

graphics graphics to be the most useful and may be enough to persuade GEM owners to convert finally to GEOS. This is helped by the inclusion of a full wordprocessor in *geoWrite 2.0*, the added IP and IP, ELM conditions possible in *geoMerge* and the icon editor that converts programs so they can be run from the GEMS desktop.

There's more to come, as London based First Analytical is set to continue its enthusiastic support for the system that should have been the official GEM operating system. Apart from an 80 column GEM version future releases include a 250,000 cell spreadsheet program called *geoCalc* and *geoFile* which supplies GEOS with a full database program.

The latest version of GEOS (1.3) costs £24.95 with *Beaver's Workshop* a reasonable £37.50, *Desk Pack 1* £29.50 and finally, the 20 new icons in *Desk Pack 1* will cost £23.95. ☐

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# Byting into the 6510

*Moving deeper into machine code programming we get things started by creating a loop and find out how the 6510 makes decisions.*

*By Bernhard-Henry Lehmann*

Computers have established themselves as valuable tools for two main reasons. Firstly, because they are able to make "decisions" and secondly, because they can repeat operations with precision and accuracy. Therefore they are extremely good at doing the very jobs which people find tedious.

In Basic you instruct the computer to make decisions, by using the "IF... THEN" statement. A well-known method of creating a loop in Basic is the "FOR... TO... NEXT" combination of statements.

In this article, I will explain how to do both these jobs in machine code. For this purpose we continue with the program theme we started in the last article, in which we printed a character - or output it - to the screen. Now we want to do the same thing 256 times, thus filling the first quarter of the screen.

## Theory

Why only the first 256 positions and not the whole screen as well?

As I have already pointed out, the 6510 is strictly an 8-bit animal, that means, most of its registers consist of eight binary bits which allow you to enter numbers only in the range from zero to 255. Put any number larger than 255 in any of its registers, and you will get an "overflow". That is, instead of 198, which we would need in order

to fill the whole screen, you will have only 232 in the register (198-172561=232)

This does not mean that we can't deal at all with larger numbers on the 6510. It only means that doing so becomes a bit more involved. Therefore, I won't deal with the procedure at this point.

## Task 1

Listing 1 gives you the source file which will do the task I have set.

Please note that I have added some "empty" lines - consisting only of line-number and semicolon - and some remarks to this listing. I did this in order to introduce you from the start to good techniques of formatting assembly files. After all, you will want to be able to understand your program in three weeks time! And since assembly listings are much more unattractive than Basic listings, it is even more important in assembly programming to acquire good programming habits. Of course, when writing a program, you will probably be far too keen to get your ideas working to concentrate on such mundane chores as formulating a remark. But believe me, when all the excitement has died down and your dreary job is to find a bug, you will be grateful to yourself for having followed this advice!

Incidentally, in assembly listings

the semicolon is used like the REM statement in Basic. It tells the assembler that what follows can be ignored.

In line 69 I call a routine in the Commodore Kernel (the second part of the operating system which starts at 57044) in order to clear the screen.

The assembly-instruction JSR stands for "Jump to SubRoutine" and is very similar to the Basic GOSUB command. We will deal with this instruction in more depth at a later stage, when we also will deal extensively with how to make use of the handy routines in the two ROMs of the C64 for your own programming purposes.

## Labels

In Listing 1, I have also introduced a very important programming tool which all assemblers worth their salt allow you to use: labels.

A label is simply a name you stick on a certain variable, as you do in Basic. In line 59 I set the value "1024" (beginning of screen memory) to the label "SCREENMEM". I do this with another one of those pseudo-instructions which are only relevant to the assembler: EQU. This is short for equals, and in Basic you would do the same thing by writing a line like SCREEN = 1024.

As in Basic most assemblers have certain rules concerning labels. A label

may not exceed a length of between six and nine characters (depending upon the particular assembler you are using), a label may not start with a number, the characters afterwards may not contain certain graphic characters and some assemblers do not allow you to use op-code mnemonics or pseudo-instructions within a label.

But the most important rule is, that a label may not be used twice. This makes sense, because you can't expect the assembler to assign different values to identical labels in the "jump, move, store, call" fashion.

### Labels As Jump-Values

There is an even more useful way in which labels in assembly language programming are employed.

Some Basic dialects that not the rather poor Basic on C64 allow you to write a line, like: GOTO PRINTROUTINE. In this case "PRINTROUTINE" is the name for a variable which you have to declare, just like any other variable, at the beginning of your program with a line, like: LET PRINTROUTINE = 1000.

This is then processed like any other variable, and when the Basic interpreter arrives at the GOTO line, it finds the value 1000, takes it as a line number and jumps to it.

Now, as we have learned in the last article, the microprocessor does not deal in line numbers. Instead it deals in memory locations which it keeps track of in its program counter. In assembly listings we use line numbers only for our own benefit, to make our listings more structured, and for the benefit of the screen editor of the assembler program, so that it can insert or delete lines.

In machine code we tell the microprocessor to jump or branch to a certain location, and the assembler allows us to declare that location as the left hand side of the assembly listing in the form of a label.

And here an assembler makes life really easy for us. In line 90 I have declared the label PRINTLOOP by throwing it out on the left hand side. I do not necessarily know which location the following instruction is at - unless I go to all the trouble of counting it out. But there is no need for that because I have set the constant start location in the first line to 4952, and this is all that's needed. The assembler does the rest.

When it comes to the label PRINTLOOP, it will take the current location address, which it has arrived at by assembling the preceding lines, set it to the label PRINTLOOP and store the label and its value in a special area of memory, called the symbol table.

Then it goes on assembling as usual, until it comes to line 140 in our program. There it finds a branch-instruction (more about this later) and a label which it will probably identify as the label which it previously has stored in the symbol table. Now all it has to do is to recover the value and write that to the jump - or branch - destination into the next location, and the microprocessor will know, where to jump to.

All this time we were on easy street. We did not have to remember yet another number. We did not even have to calculate that number! Instead we were able to use a nice, memorable word of our own choice, which even serves us as a sort of remark!

Compare that with the unstructured ways of most Basic dialects, and you will understand why yours truly prefers to program in assembly language!

### Index Registers

In line 90 of Listing 1 we are introduced to the X-register which is the second of the three programmable registers of the 6510. The third is the Y-register. Both the X-register and the Y-register are called index registers and are used in similar ways.

Like the A-register an accumulator the index registers are 8-bit registers, that is, they are able to hold numbers in the range of zero to 255. But unlike the A-register, the index registers are not used for adding or subtracting numbers. In fact, all you can do with them, besides loading or unloading them, is increment or decrement their contents by one. This makes them quite unsuitable for arithmetical operations. Instead the index registers are used as a kind of moving pointer, which allows the programmer to define the input or output addresses in a flexible way.

But instead of confusing you with more clever definitions, let's look again at the listing of our program example.

In line 90 I load the X-register with zero, using a similar input instruction to the LDA instruction which we have introduced in the last article. LDA

stands for Load the X-register with ...

Our task is, as you will remember, to print some "A"s at the first 256 positions of the screen. We could do this job the hard way by making use of what we have learned already and writing a program something like this:

```
1 LDA #1
2 STA 004
3 STA 005
4 STA 006
etc.
```

This is of course an absurdly laborious way of doing it and would require 256 lines of assembly in order to fill the 256 screen positions.

You may already have an inkling of what the answer to our problem might be - at least in Basic. We have to construct some kind of loop which starts off with LDA and increments the value by one with each pass through the loop.

This is where the X- or index register comes in. In line 90, the X-register is loaded with zero. Then the loop is entered, which we may name after the label PRINTLOOP.

In line 90, the A-register is loaded with one, which stands for counts for the letter "A". This needs to be output to the screen memory location, starting from 004 (three described with the label SCREENMEMORY).

The X after the comma stands for the X-register, and if you substitute that comma in your mind for a +, you know at once, what this construction is all about. We instruct the microprocessor to add the value in the X-register to the absolute address given after STA. And since the value in the X-register at this point is zero, the microprocessor will arrive at the location 004+0=004.

In line 100, the X-register is incremented by one, using the very simple instruction INX, which stands for INcrement the contents of the X-register (by one).

In line 140, the "PRINTLOOP" is closed by using a conditional branch instruction (more about this in a minute), which has in this example, a very similar effect to the Basic command: IF X < 255 THEN GOTO 90.

The program now loops back to line 90. In line 100, the contents of the

X-register are again added to the value LDA, which is loading behind the label SCREENMEM. And since the X-register now contains one, the microprocessor calculates the original address as  $1024 + 1025$ . Result: It outputs the letter A to the next screen position.

The confusing bit of the instruction STA SCREENMEM,X for the novice is the comma after SCREENMEM. Above I suggested for clarification to substitute this comma in your mind with a plus sign. This brings us to the question: why can't a plus sign be used in the first place?

There are indeed occasions where you use a plus sign, but this, even though serving a similar function, constitutes a different situation, as far as the assembler is concerned: LDA SCREENMEM,X is to be translated into a full-blown machine code instruction which the microprocessor will understand, as I have described above, and then execute.

On the other hand, LDA SCREENMEM+1, for example, which is quite legitimate with most assemblers, will in practice be treated differently. It will be calculated by the assembler and not by the microprocessor. All the microprocessor will get is 1025 and before that the opcode 84, and that, as you will recognize from the assembler listing I gave you in the last article, is good old absolute addressing.

In the next two lines (110 and 120) a similar command with the colour memory makes the "A" visible on the screen for those of you who, like myself, will have the old KCM.

## Branch-Instructions

In line 140 we close our loop by using a so-called relative branch-instruction.

BNE stands for "Branch if Not Equal" and is a sort of GOTO combined with an IF... THEN instruction. As a matter of fact, in Basic you might put the whole thing in a line like this: IF X <= 0 THEN GOTO...

"Relative" means, that the length of the jump and the direction is defined in rather a special way, instead of giving the full destination address to the microprocessor, the distance between the branch-instruction and the destination, where the branch is going to, is given in bytes.

In our program this distance is 13 bytes long, and that includes the branch-instruction itself, since the program counter of the 6501 is always pointing at the next instruction (in our case BNE) when the whole instruction is executed.

And since we have to branch (or jump) backwards this is subtracted from 256, giving 243. This is called a negative number in machine code terms, even though, strictly speaking there are no negative numbers in machine coding. But in order to be able at least to imitate negative numbers, one uses the rather strange convention of splitting the available 256 numbers in a byte into two and calls number zero to 127 positive and numbers 128 to 255 negative.

These conventions are rather confusing to the novice, because at school we all learned that a negative number has a minus sign in front of it. Now we learn that if this number is larger than 127.

## What's it all about?

When we learned algebra at school, we dealt with negative and positive numbers of any size, that is numbers in the range of minus infinity to plus infinity. Such a range is impractical for an 8-bit microprocessor which can only deal with numbers in the range of zero to 255 (even though by programming it the right way, you can make it deal with practically any number, positive as well as negative).

And since a microprocessor hasn't got a register that shows if a number is positive or negative (that would be a waste of valuable shipspace), we now have to learn the convention that under certain circumstances, quite arbitrarily, numbers in the range of zero to 127 are said to be positive, while numbers in the range of 128 to 255 are said to be negative. Just because it makes micro-technology.

As far as our branch-instructions are concerned, this means of course, that they are limited to 128 byte jumps either way. If you want to jump any further than that, you have to use a combination of a relative branch instruction and an absolute jump-instruction, which allows you to jump from anywhere to anywhere in the computer.

Since these jump-instructions are so simple, we might as well include

them there: JMP 50000, for example, stands for "JUMP to location 50000".

But why use relative branch instructions at all and not absolute jumps, as described above?

Relative jumps need only two bytes to give the instruction (the instruction itself and the "offset", as it is called, which requires only one byte), while absolute jumps require three bytes (destination plus low byte plus high byte).

Computers like the C64 haven't got an unlimited amount of RAM, and as a very long machine code program those saved bytes add up very quickly, as you will find out.

Furthermore, if you want a jump with a condition attached to it, the 6501, ever the simple creature, does not support any conditional absolute jumps.

## The Processor Status Register

This brings me nearly to the last thing we want to deal with in this article. The conditional aspect of the branch-instruction BNE, which we've used in line 140 of our program.

The microprocessor, as we have learned, is the real computer, and as we have some built-in facility to make decisions.

This decision-making register, if you like, is called the Processor Status Register (PS for short) or more commonly the flag register.

Strictly speaking it's not a decision-making register at all, but a sort of electronic notepad which is updated every time the 6501 has executed an instruction.

It's very simple, really. Like most registers in the 6501 the PS-register is just another location consisting of eight binary bits. Those eight binary bits make up any number in the range between zero and 255, but, unlike the other registers, the whole number isn't of any interest here. Instead the eight binary bits are treated separately and a special function is assigned to each of them.

This special function is called a flag, and like any other binary bits there are two states in which you can find a flag: It can either be set (=1) or it can be clear (=0). If the flag is set, then we say, that the condition, which is attached to this particular flag is met (True). If, on the other hand, the flag is clear, then we say, that the condition is not met (Not).

Different flags are tied to different conditions. The most often used flag of the 6502 is the zero-flag. It sets if a result of an input or output operation or an arithmetical operation is zero or not zero.

Most of the instructions for the 6502 have an influence on the zero-flag. If, for example, you load the accumulator with zero, the zero-flag will be set, because the condition of the flag is being met. If you load the accumulator with any number in the range from one to 255, the zero-flag will be cleared, because now the condition of the flag is not met. Equally, if you subtract 0 from 0, the flag again will be set while, if you add 0 plus 0, the flag will be cleared.

The slightly confusing aspect of the zero-flag is that it is SET if the result is zero and that it is CLEAR if the result is not zero! So, remember this well!

The use of all this becomes clear in our program. We start off with the *r*-register containing zero, and with each pass through our loop, we increment it by one. This means of course, that the content in *r* is always not zero or greater than zero, and that is true results in the program branching back to PRINTLOOP, because the BMI-instruction implies: "Branch, if the result is not equal, that is, if the zero-flag is not set."

The moment the zero-flag was set, the microprocessor would continue in a straight line and end up with the RTS instruction in line 108, and that means, of course, that our program is finished.

When does it actually become zero, when we are constantly adding one to it?

It becomes zero the moment the full capacity of the 8-bit *r*-register has been reached. And this happens, of course, when we add 1+255=256, if you include the zero as one result like does in computers. Because then, like the mileage counter in a car, the register starts from zero again, and this means, that the zero-flag will be set, the condition of the BNE-instruction is not being met any more and the 6502 zooms straight through to the exit in line 100.

Incidentally, of the eight flag-bits in the PS-register, two are never used, and from the remaining six bits, only two (or perhaps three) are used regularly in program applications. The other three bits are only used in our specialised applications, and it will be

Figure 1

LDA = Load the accumulator (A-register) with ... (Input)  
 STA = Store the contents of the accumulator in ... (Output)  
 LDX = Load the *x*-register with ... (Input)  
 STX = Store the contents of the *x*-register in ... (Output)  
 INX = Increment the contents of the *x*-register (by one)  
 DEX = Decrement the contents of the *x*-register (by one)  
 LDY = Load the *Y*-register with ... (Input)  
 STY = Store the contents of the *y*-register in ... (Output)  
 INY = Increment the contents of the *y*-register (by one)  
 DEY = Decrement the contents of the *y*-register (by one)  
 JSR = Jump to Subroutine  
 RTS = Return from subroutine  
 JMP = Jump to location ...  
 BNE = Branch if result is Not Equal - if the zero-flag is NOT set.

a long, long time, before you use any of them - if you ever do.

## Finally

In Figure 1 is a list of all the op-codes I have introduced so far and these fall meaning. I also add most of the op-codes containing the *x*-register and the *y*-register. In the course of what we have dealt with in this article, the *Y*-register does exactly the same thing as the *x*-register. As a matter of fact, in listing 1 I could have used *Y* instead of *X*.

Listing 2 gives you the Basic

equivalent of our machine code program. I thought I might add this, so that you can have a practical demonstration of the difference in speed between Basic and machine code.

Next time you might be able to impress your friends even more, because then we will expand on our programming theme one final step further and fill the whole screen. By then you will already have been introduced to the most widely used instructions of the 6502 and might even be able to start writing your own programs. ☺

### LISTING 1

```

10          CPU 6502
20          SCREEN% EQU 1004
30          COLUMN% EQU 50/80
40          FOR NEXT% , CLEAR SCREEN
50          |
60          |
70          |
80          |
90          |
100         |
110        |
120        |
130        |
140        |
150        |
160        |
170        |
180        |
190        |
200        |

```

### LISTING 2

```

30 FOR COMPASSIBLE SCREEN IN BASIC
40 PRINT CHR$(147)
50 SC=1004: CO=50/80
70 FOR %1 TO 256
80 POKE SC,%1: POKE CO,%1
90 SC=SC+1: CO=CO+1
70 NEXT

```

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To help readers, we do provide a Software for Sale service that makes all of the software from each month available on disk or cassette. Unfortunately because of duplication problems we are only able to provide C16 and Plus/4 programs on our monthly disk. Now, however we are able to produce our latest Plus/4 and C16 Software offer for both disk and tape users.

## Documentation

All the programs that are on the tape are from recent issues of *Your Commodore*. Should you not happen to have access to any of the relevant articles then you can purchase back issues of the magazine from:

Infonet Ltd, Times House, 179 The Markways, Hamel Hempstead, Herts. HP1 1BB. Tel (0442) 44435.

The cost of a back issue is £1.50 including postage and packing.

## What Do You Get?

So just what is on the latest Software cassette or disk?

## Word-Pro Add-On

This program is for use with the in-built wordprocessing software on a Plus/4. The program produces descenders on an MPS 801 or 803 printer. Both of which don't usually print descenders below the level of all of the other characters. Using descenders gives your letters etc. a much more professional feel.

This program will only work with a disk drive for LOAD, SAVE etc. You can however still use the software for typing text though you will not be able to SAVE any information.

## Spelling Checker

Another useful addition to the in-built wordprocessor on the Plus/4. This program works in conjunction with a disk drive, NOT TAPE, and will build up its own dictionary of words as you use it. The program will go through any text file that you have created and highlight any words that are not in the dictionary so that you can correct them if the spelling is wrong or tell the program to add the word to its dictionary if the spelling is correct.

## Crabble

If you've ever played crabble then you'll know just what an addictive game it is. If you haven't then try our Plus/4 version of the game.

This computer version of the popular card game lets you battle it out

with the computer rather than an other player.

## Lower Case Graphics

Anyone familiar with the C16 or Plus/4 will know that there are two character sets available, an upper case/graphics set and a lower case/upper case set. When it comes to graphics modes however, you are only allowed to use the upper case set.

This short program demonstrates how you can access the lowercase set while in a graphics mode improving the way that your graphic screens look.

## Character Editor

This character editor allows you to design your own characters with ease and save them on to tape or disk for use at a later date within your own programs.

Also included on the cassette or disk are a number of different character sets that you can use as they are or modify using the editor. There's even a program that explains just how you get about using your own character sets within your own programs.

## Dual Programming

This program allows you to have more than one program in the memory of your Plus/4 at one time. Switching between the programs is simply a matter of pressing a couple of keys.

## This Month

Not only are all of the above programs available on the tape or disk but all of the programs in this issue of the magazine will also be placed on it.

## CI6's and Memory Expansion

The CI6 and Plus/4 computers are almost identical, except for the fact that the CI6 has far less memory than the Plus/4. This compatibility means that programs for one of these computers will usually work on the other computer if enough memory is available.

A number of companies produce memory expansion cartridges for the CI6 that expand its memory to varying degrees. If you have one of these cartridges then all of the above programs should work with the CI6, except of course, those that use the Plus/4's built-in software.

## How Much Do They Cost?

The price of the software is £4.00 for cassette and £6.00 for a disk.

Orders should be sent to the address on the order form for readers services **NOT** to the editorial address.

Orders should be accompanied by

a cheque or postal order for the correct amount made payable to Argus Specialist Publications.

We welcome orders from our overseas readers. However we do have to add a further £1.00 in order to cover the increased postage charges.

## ORDER FORM — PLEASE COMPLETE IN BLOCK CAPITALS

NAME	VERSION	QTY	ORDER CODE	PRICE
PLUS4 SPECIAL R	TAPE		5100R	£4.00
PLUS4 SPECIAL R	DISK		5100R	£6.00
Domestic Postage £1.00				
TOTAL				

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Commissions, Reader Services, Argus Specialist Publications, 9 Mill Road, Broom's Barn, Hemel Hempstead, Herts AL2 7BW. Please allow 28 days for delivery.

## CI6/PLUS 4 Centre



### CI6/4 REFERENCE BOOK £7.00

The book lays special emphasis on the graphics, sound, words and machine code programming. The graphics cover standard, multi colour, high resolution bit mapping, soft scrolling and water interrupt. Its coverage of machine code is extensive and gives full information regarding KERNEL routines and how to use them in your own programs. The book gives complete memory map, 7600 processor commands, C64-C16 comparison chart to enable conversions and the all important KERNEL jump table. The subject index discussion is explained fully and illustrated by examples, often with line by line explanations.

### C64 RAM PACK £38.00

Extends to C16 memory to 64K to enable you to play PLUS 4 games.

### TURBO PLUS Cartridge £75.00

All specific actions LOAD, SAVE, VERIFY and MERGE, use special stability 10 times faster. Basic or Machine Code. A number of additional commands like CHANGE, COMPARE, DUMP, FIND, MERGE, etc. are provided. SCROLLER lets you scroll back (using Forward) and backward using the cursor keys (even within windows). PLUS 4 expansion allows three out of four PLUS 4 built-in programs (Graphics, Word Processing and Calculator) to be used with cassette players. The software built-in the data filing system using more than 250 entries is also modified.

### PAUSE PLUS Cartridge £25.00

The cartridge will allow you to stop almost all games and let you dump the picture on the screen to a Commodore compatible printer. The facility to transfer the pictures to a disc or tape is also provided.

### MICRO LEX Cartridge £12.00

Powerful WORD PROCESSOR for C16 and PLUS 4 series.

- \*100% machine code program for fast response.
- \*JUSTIFY left and right, CENTRE text.
- \*DELETE (with SHIFT) lines or characters.
- \*WORD SEARCH and REPLACE facility.
- \*Semi-automatic word splitting facility.
- \*Function keys can be assigned to most common word marks.
- \*LOAD/SAVE to tape or disc.

### MICRO CALC Cartridge £12.00

Powerful 100% machine code SPREAD SHEET program.

- \*Jump to any cell on the sheet.
- \*REPLACES facility.
- \*INSERT/DELETE rows or columns.
- \*Process the whole sheet calculation automatically or cell by cell.
- \*Edit/delete and insert functions.
- \*Sum or mean of rows or columns.
- \*Sum or highest value in any column or row.
- \*Print whole or part of the spread sheet.
- \*Justify left and right for format printing.
- \*LOAD/SAVE to tape or disc.
- \*Assign function keys to most common word marks.

### MICRO BASE Cartridge £12.00

A universal DATA BASE program to keep addresses, records, etc.

- \*BASE generation over whole screen.
- \*SORT with any data field.
- \*Powerful PRINT facilities including LABELS.
- \*WORD SEARCH facility.
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- \*Assign Function keys to limit.

These items are available in all good Computer Shops. In case of difficulty contact: **CI6/PLUS 4 CENTRE**, AMCO MARKETING LTD., 38 WEST HILL, DARTFORD, KENT, DA1 2EL. Telephone: 0332 522621

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# Contributions

*So you own a Commodore? So you've  
written some programs? So why haven't you  
sent them to us?*

**Y**our Commodore is always on the look out for new programs, hints and tips, articles and even regular notes. In fact if you have something that you think could be of use to other Commodore owners we want to hear about it.

So if you have got something which you think we may be interested in, how do you go about submitting it to us?

Below you will find a list of guidelines that will help us to deal with any item that you send in to us. We don't expect everybody to be the next William Shakespeare but if you do follow these simple rules then it will make our job a lot easier.

1) If possible all material sent to the magazine should be typed or printed out on a computer printer.

2) All text should be double spaced i.e. there should be a blank line between each line of text. You should also leave a margin of about 10 characters around the text.

3) On the very first page you should put the following:

Name of the article  
Machine that it is for  
Any extra required - disk, printer etc.

Your name  
Your address  
Your telephone number

4) The top of every page should have the following information on it:

Abbreviation of the article title  
Your name  
The page number

For example, suppose you had submitted an article on C64 interrupts. You should put something like the following at the head of the page:

Interrupts/J. Smith/1

5) Please make sure that you do not make any additional marks on your text especially underlining.

6) Try and write in clear concise English, it does not have to be a work of literature but it must be comprehensible.

7) On the bottom of each page you should put the word MORE if there are more pages to the article or END if it is the last page.

8) If possible, enclose a listing of all programs.

9) Under no circumstances use a staple to hold the pages together. Use a paperclip instead.

10) Programs should be included on either disk or tape. Make sure that you SAVE two copies of every program so that we have a better chance of loading them if problems occur.

11) Programs under 10 lines can be included in the text. If your program is longer than this you must enclose a disk or cassette.

12) If your article needs any artwork then supply clear examples of what is needed. We don't expect you to be an artist but we do need to see what is required.

13) Photographs, if necessary, must be either black and white prints or colour slides. We can take them ourselves so don't worry about this too much.

14) Submissions of any length are welcome. If you have a five line routine that you think may be of use to someone else we welcome it just as much as a full blown six part series.

15) Payment varies quite a lot and depends on quite a number of factors, such as complexity of program, presentation of program, number of magazine pages it takes up etc. Payment is generally between £10.00 and £200.00.

16) All payments are made in the month that the magazine containing your article has appeared in print.

17) If we do find your submission suitable for inclusion in the magazine we will write to you giving the terms of publication, the rate of payment and an agreement form. Prompt return of this form will allow us to use your program as soon as possible.

18) If you want the program returning to you, should we find it unsuitable for publication, then you should enclose a stamped self addressed envelope.

19) The last and most important thing to make is 'get writing', we are waiting for your articles.



# Plus/4 and C64 Cruncher

*Speed up your programs with these handy utilities.*

*By William Sellers*

**W**hen writing programs in Basic it is essential that you make them as easy as you possibly can. This generally means spacing your listings out, and putting in lots of REM statements etc. If you don't do this and you find a bug somewhere in your program, it's going to take you a long time to locate the error.

There are however a couple of problems with well documented programs. Firstly, the program will take up a large amount of memory that is necessary and, secondly, the program will RUN a little slower.

The two utilities presented here, one for the C64 and one for the Plus/4, will solve these problems by crunching a program down to its smallest possible size.

## What Happens?

The two utilities presented here can be used to crunch your program. In effect, what the programs do, is to search through a Basic program and remove all the unnecessary spaces, e.g. PRINT "HI" would become PRINT"HI", all REM statements are also removed since they aren't necessary to the running of the program. Next, the program places as many instructions on one line as it can. For example the program:

```
10 PRINT "HI"
20 PRINT "THERE"
```

would become:

```
1 PRINT"HI";PRINT"THEE"
```

Once crunched the program is renumbered. The renumber is to cater of any GOTOs, GOSUBs etc.

Once the program has been crunched in this way it will not only take up far less memory but will generally RUN slightly faster than it did in its original form.

## Weird Lines

It is worth pointing out that when you list a program that has been crunched some of the lines will be far greater than the 80 characters normally allowed in Commodore Basic. You must never attempt to edit a line that covers more than two screen lines since the text from the third line onwards will be lost forever. Should you need to make changes make them on your original program and then crunch it again.

## Getting It In

There are two versions of the Cruncher program, one for the C64 the other for the Plus/4. I will deal with creating each program in turn.

### C64 Cruncher

The program is presented here in the form of a Basic loader. You should enter this program using our SYNTAX CHECKER program that can be found on the LISTINGS page.

Once you have entered the program, SAVE it to disk or tape before running. If you are using tape, make sure that you have changed the

right to a one where indicated in the listing.

Once you have SAVED this program out, you can then RUN it. If you have made any errors they will be indicated. Correct the program as necessary and RUN it again.

Once the program has finished it will SAVE a new program out to tape or disk called C64-CRUNCHER. This is the program that you will use in future, not the LOADER. Whenever you want to use the cruncher you should LOAD it into your computer file.

```
LOAD "C64-CRUNCHER",A1:FOR DISK
OR
LOAD "C64-CRUNCHER",L1:IF USING TAPE.
```

Once it has LOADED you should make sure that the program to be crunched is in memory and then activate the cruncher by typing:

```
STS 40152
```

The amount of time taken to crunch a program depends on how large the Basic program is, so be prepared to wait a short while.

Once the program is crunched you can SAVE the new Basic program to tape or disk and use it as normal.

### Plus/4 Cruncher

This version of the cruncher is a little more complicated to enter than the C64 version. There are two programs



that you must enter P4-LOADER and P4-CREATOR.

If using cassette, then make sure that you make the changes as indicated in the listing.

Cassette users should also SAVE the two programs on different cassettes. I will explain why later.

Once both programs have been entered and SAVE'd you should turn OFF and ON your computer and then enter the following line:

```
POKE 1019:POKE 144,21:POKE 7000,
ONEW
```

Now LOAD and RUN the program P4-CREATOR.

When this program has finished working it will SAVE a new program

out to tape or disk. If using cassette, you should set up your cassette such that this new program will be SAVE'd straight after the P4-LOADER program. This was the reason that I told you to SAVE the programs on separate tapes.

### Running On The Plus/4

The program P4-CREATOR is no longer needed. To use the program all that is required are the P4-LOADER program and the one created by the P4-CREATOR program. Should you look on your tape or disk you will find that this is called P4-CRUNCHER.

To use the program simply LOAD and RUN the program P4-LOADER. This will automatically LOAD the

program P4-CRUNCHER.

Once this process is finished you can then LOAD the program that you wish to crunch into the Plus/4 and access the cruncher with the command:

```
SYS DEC(=1000)
```

Once the cruncher has finished working you can save the compressed program out to tape or disk to use normally.

### Note

Don't forget you should never attempt to edit a crunched program. Always make changes to the original and then re-crunch that.

PROGRAM: P4-CREATOR	
10	00 PRINT"PLEASE PRESS ANY KEY TO
20	00 GOTO 10:GOTO 1000
30	00 END
40	00 PRINT"PLEASE PRESS ANY KEY TO
50	00 GOTO 10:GOTO 1000
60	00 END
70	00 PRINT"PLEASE PRESS ANY KEY TO
80	00 GOTO 10:GOTO 1000
90	00 END
100	00 PRINT"PLEASE PRESS ANY KEY TO
110	00 GOTO 10:GOTO 1000
120	00 END
130	00 PRINT"PLEASE PRESS ANY KEY TO
140	00 GOTO 10:GOTO 1000
150	00 END
160	00 PRINT"PLEASE PRESS ANY KEY TO
170	00 GOTO 10:GOTO 1000
180	00 END
190	00 PRINT"PLEASE PRESS ANY KEY TO
200	00 GOTO 10:GOTO 1000
210	00 END
220	00 PRINT"PLEASE PRESS ANY KEY TO
230	00 GOTO 10:GOTO 1000
240	00 END
250	00 PRINT"PLEASE PRESS ANY KEY TO
260	00 GOTO 10:GOTO 1000
270	00 END
280	00 PRINT"PLEASE PRESS ANY KEY TO
290	00 GOTO 10:GOTO 1000
300	00 END
310	00 PRINT"PLEASE PRESS ANY KEY TO
320	00 GOTO 10:GOTO 1000
330	00 END
340	00 PRINT"PLEASE PRESS ANY KEY TO
350	00 GOTO 10:GOTO 1000
360	00 END
370	00 PRINT"PLEASE PRESS ANY KEY TO
380	00 GOTO 10:GOTO 1000
390	00 END
400	00 PRINT"PLEASE PRESS ANY KEY TO
410	00 GOTO 10:GOTO 1000
420	00 END
430	00 PRINT"PLEASE PRESS ANY KEY TO
440	00 GOTO 10:GOTO 1000
450	00 END
460	00 PRINT"PLEASE PRESS ANY KEY TO
470	00 GOTO 10:GOTO 1000
480	00 END
490	00 PRINT"PLEASE PRESS ANY KEY TO
500	00 GOTO 10:GOTO 1000
510	00 END
520	00 PRINT"PLEASE PRESS ANY KEY TO
530	00 GOTO 10:GOTO 1000
540	00 END
550	00 PRINT"PLEASE PRESS ANY KEY TO
560	00 GOTO 10:GOTO 1000
570	00 END
580	00 PRINT"PLEASE PRESS ANY KEY TO
590	00 GOTO 10:GOTO 1000
600	00 END
610	00 PRINT"PLEASE PRESS ANY KEY TO
620	00 GOTO 10:GOTO 1000
630	00 END
640	00 PRINT"PLEASE PRESS ANY KEY TO
650	00 GOTO 10:GOTO 1000
660	00 END
670	00 PRINT"PLEASE PRESS ANY KEY TO
680	00 GOTO 10:GOTO 1000
690	00 END
700	00 PRINT"PLEASE PRESS ANY KEY TO
710	00 GOTO 10:GOTO 1000
720	00 END
730	00 PRINT"PLEASE PRESS ANY KEY TO
740	00 GOTO 10:GOTO 1000
750	00 END
760	00 PRINT"PLEASE PRESS ANY KEY TO
770	00 GOTO 10:GOTO 1000
780	00 END
790	00 PRINT"PLEASE PRESS ANY KEY TO
800	00 GOTO 10:GOTO 1000
810	00 END
820	00 PRINT"PLEASE PRESS ANY KEY TO
830	00 GOTO 10:GOTO 1000
840	00 END
850	00 PRINT"PLEASE PRESS ANY KEY TO
860	00 GOTO 10:GOTO 1000
870	00 END
880	00 PRINT"PLEASE PRESS ANY KEY TO
890	00 GOTO 10:GOTO 1000
900	00 END
910	00 PRINT"PLEASE PRESS ANY KEY TO
920	00 GOTO 10:GOTO 1000
930	00 END
940	00 PRINT"PLEASE PRESS ANY KEY TO
950	00 GOTO 10:GOTO 1000
960	00 END
970	00 PRINT"PLEASE PRESS ANY KEY TO
980	00 GOTO 10:GOTO 1000
990	00 END



80	898	904095.0	1.071,32,803,103.	
	899	904094	80,100	
87	904	904097.30	100,100,100,100,0	
			4,100,100	
	905	904098.100,100,	100,100,100,10	
			0.10,100,100	
88	906	904099.001,100,100,	100,100,100,	
			0,100,100,100	
89	907	904100.100,81,	100,100,100,	
			100,100,100	
90	908	904101.100,100,	100,100,100,0	
			0,100,100,100	
91	909	904102.100,100,	100,100,100,1	
			0,100,100,100	
92	910	904103.100,100,	100,100,100,1	
			100,100,100,1	
93	911	904104.100,100,	100,100,100,	
			100,100,100,100	
94	912	904105.100,100,	100,100,100,	
			100,100,100,100	
95	913	904106.100,100,	100,100,100,	
			100,100,100,100	
96	914	904107.100,100,	100,100,100,	
			100,100,100,100	
97	915	904108.100,100,	100,100,100,	
			100,100,100,100	
98	916	904109.100,100,	100,100,100,	
			100,100,100,100	
99	917	904110.100,100,	100,100,100,	
			100,100,100,100	
00	918	904111.100,100,	100,100,100,	
			100,100,100,100	
01	919	904112.100,100,	100,100,100,	
			100,100,100,100	
02	920	904113.100,100,	100,100,100,	
			100,100,100,100	
03	921	904114.100,100,	100,100,100,	
			100,100,100,100	
04	922	904115.100,100,	100,100,100,	
			100,100,100,100	
05	923	904116.100,100,	100,100,100,	
			100,100,100,100	
06	924	904117.100,100,	100,100,100,	
			100,100,100,100	
07	925	904118.100,100,	100,100,100,	
			100,100,100,100	
08	926	904119.100,100,	100,100,100,	
			100,100,100,100	
09	927	904120.100,100,	100,100,100,	
			100,100,100,100	
10	928	904121.100,100,	100,100,100,	
			100,100,100,100	
11	929	904122.100,100,	100,100,100,	
			100,100,100,100	
12	930	904123.100,100,	100,100,100,	
			100,100,100,100	
13	931	904124.100,100,	100,100,100,	
			100,100,100,100	
14	932	904125.100,100,	100,100,100,	
			100,100,100,100	
15	933	904126.100,100,	100,100,100,	
			100,100,100,100	
16	934	904127.100,100,	100,100,100,	
			100,100,100,100	
17	935	904128.100,100,	100,100,100,	
			100,100,100,100	
18	936	904129.100,100,	100,100,100,	
			100,100,100,100	
19	937	904130.100,100,	100,100,100,	
			100,100,100,100	
20	938	904131.100,100,	100,100,100,	
			100,100,100,100	
21	939	904132.100,100,	100,100,100,	
			100,100,100,100	
22	940	904133.100,100,	100,100,100,	
			100,100,100,100	
23	941	904134.100,100,	100,100,100,	
			100,100,100,100	
24	942	904135.100,100,	100,100,100,	
			100,100,100,100	
25	943	904136.100,100,	100,100,100,	
			100,100,100,100	
26	944	904137.100,100,	100,100,100,	
			100,100,100,100	
27	945	904138.100,100,	100,100,100,	
			100,100,100,100	
28	946	904139.100,100,	100,100,100,	
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29	947	904140.100,100,	100,100,100,	
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30	948	904141.100,100,	100,100,100,	
			100,100,100,100	
31	949	904142.100,100,	100,100,100,	
			100,100,100,100	
32	950	904143.100,100,	100,100,100,	
			100,100,100,100	
33	951	904144.100,100,	100,100,100,	
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34	952	904145.100,100,	100,100,100,	
			100,100,100,100	
35	953	904146.100,100,	100,100,100,	
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36	954	904147.100,100,	100,100,100,	
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37	955	904148.100,100,	100,100,100,	
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38	956	904149.100,100,	100,100,100,	
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39	957	904150.100,100,	100,100,100,	
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40	958	904151.100,100,	100,100,100,	
			100,100,100,100	
41	959	904152.100,100,	100,100,100,	
			100,100,100,100	
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43	961	904154.100,100,	100,100,100,	
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44	962	904155.100,100,	100,100,100,	
			100,100,100,100	
45	963	904156.100,100,	100,100,100,	
			100,100,100,100	
46	964	904157.100,100,	100,100,100,	
			100,100,100,100	
47	965	904158.100,100,	100,100,100,	
			100,100,100,100	
48	966	904159.100,100,	100,100,100,	
			100,100,100,100	
49	967	904160.100,100,	100,100,100,	
			100,100,100,100	
50	968	904161.100,100,	100,100,100,	
			100,100,100,100	
51	969	904162.100,100,	100,100,100,	
			100,100,100,100	
52	970	904163.100,100,	100,100,100,	
			100,100,100,100	
53	971	904164.100,100,	100,100,100,	
			100,100,100,100	
54	972	904165.100,100,	100,100,100,	
			100,100,100,100	
55	973	904166.100,100,	100,100,100,	
			100,100,100,100	
56	974	904167.100,100,	100,100,100,	
			100,100,100,100	
57	975	904168.100,100,	100,100,100,	
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58	976	904169.100,100,	100,100,100,	
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# Games Reviews

*If you've got a bit of spare cash then a game is as good a way as any to use it up. Here's a selection of some of the latest software on offer.*

## ZONE BANGER

**E**ven dustbin men have got to go high-tech sometimes. As more and more satellites are launched, so space itself begins to get cluttered. Therein is a few asteroids and life soon becomes hazardous for those seeking to explore the final frontier.

So it is that you take up your new appointment as a Zone Banger. Working for the Cosmic Garbage Clearance Company, your new position is that of Orbital Debris Destruction operator.

What this means in reality is that you whizz round space blasting everything in sight for as long as possible without crashing in to one of the multitude of hazards. These include large lumps of rock (which split into two when you hit them - remember asteroids!) and the occasional satellite. There are also some lethal beams to be dodged as well.

On the plus side, you can seek temporary refuge by driving into a warp hole, gain temporary immunity from a squibler or gain access to the lower Sanctum where, if you can navigate through a series of passages avoiding bumpers and sliding doors, help is at hand.

Zone Banger isn't reasonable shoot-em-up, especially at the price but, written back in 1994, it is beginning to look very dated. **G.R.H.**

### Timeline

*Title:* Zone Banger. *Machine:* C64. *Supplier:* Fiedel, Active, Williams Music, Upper St Martin Lane, London WC2H 9SE. *Tel. 01 379 6773. Price:* £4.99.

*Originality:* 3/10. *Graphics:* 4/10. *Playability:* 7/10. *Value:* 6/10.

## CYBORG

**N**o-one was quite sure what Asterus was or where it came from. A small asteroid, it was on a collision course with Earth. A month ago, when astronauts were launched with the brief to go and investigate. Five days ago, radio contact was lost. All you have to do is find them, give them some extra fuel and restore the radio link.

As you leave your ship, you soon discover a life that takes you deep under the surface of the asteroid. Codes must be gleaned to access various terminals and there are guards to be avoided. Although the initial area appears small, there is a huge variety of life and passages to be explored.

The display is divided up into three windows. Across the top of the screen is a 3D-ish view of your surroundings, bottom left is the information panel and bottom right the control panel. This gives you access to a range of commands such as picking up and examining objects, scanning the surrounding area, re-loading your weapons and analysing the character of anyone that you have just bumped off.

The game looks very much like a cross between Impossible Mission and Nexus but there are one or two areas where the gameplay could be improved. Positioning your man has to be very precise if you are to examine or pick up anything, and I found frustration quickly setting in. The





some apples to walking into rooms, and being able to walk through the bodies of your adversaries, most disappointing. Also, all sense of action is lost everywhere you access the control panel and the game freezes. The enemy stand motionless while you decide what you want to do.

The animations included with the game are delightfully vague which is fun enough but this ought to be some escape mechanism if you blunder into something that you can't see, handle. For example, I entered one room and was examining all the objects when I logged on to a computer terminal by entering the floor code. The computer then exposed some other input and refused to let me log off until I had entered it. As I did not particularly relish the idea of a few hours' looking, there was no alternative but to switch off. Game positions can be saved but again problems were encountered with the machine crashing on a couple of occasions.

Cyborg has some very nice ideas but they all seem to have been put together in the wrong order with the result that it is let down by some poor gameplay. **G.R.R.**

#### Twinkle

**Title:** *Cyborg*. **Machine:** C64. **Supplier:** CRI, CRI House, 4 Kings Yard, Capenhurst Road, London E15 2JQ. **Tel:** 01-551 7000.

**Originality:** 3/10 **Graphics:** 8/10 **Playability:** 4/10 **Value:** 6/10.

## ACCOLADE COLLECTION

A trio of games from Accolade's first year makes an impressive line up for a three for the price of one compilation.

For only 19.95 you can fly a space freighter packed full of to the north in *Blindfall*, which is the best baseball game in town, and march a frontier town in *Lure of the West*. All three games have one thing in common — they've got some of the best graphics you're ever likely to see.

Captaining a freighter on the edge of the galaxy in the 26th century isn't easy as you'll find out if you sign up for the *Tri-5 Trading Company*. Not only do you have to run the gamut of pirate plundering your precious cargo you have to rely on the robots, moles and aliens that volunteer for your crew.

You have five positions to fill and six candidates to choose from for each post and they all have their own strengths and weaknesses. This choice is essential as the usually big size, repair, fire weapons, magic and man in the ship. You just issue orders and worry a lot.

Once you're on your way to the stars through dockhouse mazes, get messages from them, panic when you're attacked and finally lose your cargo but you'll have learned not to rely on a pink fairy when to lay your weapons.

Do you fancy yourself as a pitcher, a rood with female sisters, changeups, and curveballs? Then climb on to the mound for a game of *Hardball*. This is quite simply the best baseball game.

It features superb graphics, particularly the pitching screen, easy gameplay with pitches, batters and batting options selected by a push of the joystick and a complete opponent that will give you a run for your money if you haven't got a human.

Finally, *Lure of the West* is actually disappointing. It is incredibly pretty to look at with you the *Lure of the West* standing with your back to the screen looking out on to a variety of western scenes.



You'll be met by a selection of townsfolk that will inspire you, challenge you and warn you of dark deeds with four multiple choice selections providing some answers. You can also draw your gun to frighten people or gun them down for you lose points for killing innocent townsfolk.

After a couple of games the situations become repetitive and the game is deemed to gather dust. Despite that, the compilations still represent excellent value for money, particularly for worthy fiction and baseball fans. **T.H.**

#### Twinkle

**Title:** *Accolade Collection*. **Supplier:** U.S. Gold/Oryx/Atari/Amiga/MSX. **Address:** 10000 Wilshire Blvd, Suite 301, Beverly Hills, CA 90210. **Tel:** 021 298 2288. **Machine:** C64. **Price:** 19.95.

**Originality:** 7/10 **Playability:** 8/10 **Graphics:** 9/10 **Value:** 8/10.

#### U.F.O.

**B**attle your way through waves after waves of aliens as you defend the Earth against yet another UFO attack. This time you're commanding the only fast craft — experimental F21 Condor fighter — capable of taking on the invading masses.





Unfortunately, the design is far from complete as your laser gun if you over heat it, and you only have a limited supply of shells and energy.

The battle is fought against a series of computerized backgrounds that play no part in the game as the action takes place in the 2D foreground. This is a shame, since a film scrolling over the tops of buildings would have added a touch of reality to a tired and tedious format.

There are a staggering four types of alien that swirl around you firing energy draining bolts at you. You can fire back and can also get top up energy supplies dropped by parachutes from a plane that flies unwatched through the main alien fleet. Why can't you fly that plane?

Look at the soundtrack and notice the pretty background, then go and spend your money on something a little more original, realistic and entertaining. **T:11**

#### Toucher

*Title: C.O.C. Supplier: Firebird, Wyldefire Manor, Upper St Martin Lane, London WC2N 9EM. Tel: 01 278 6273. Machine: C64. Price: £7.99. Originality: 3/10. Playability: 4/10. Graphics: 5/10. Value: 4/10.*

### VIDEO MIANIES

The term video mianies takes on a new meaning when you have to battle through screens of manies in an attempt to



turn on 15 video screens ready for a day's work. The videos belong to a crazy millionaire who hires in a castle full of manies and you to his robot.

This isn't going to be easy as you have to navigate past exploding TVs that release a shower of deadly debris, power beams that could rip you apart, blast your way through self-repairing walls, find colour coded keys for locks and finally, you reach the first video screen.

You either just collect the screen and carry on with the game with a top up of energy or you can gamble on a steadily increasing machine. Press the button at the right time and you may get a bonus score, points for any remaining things or even an extra life. Get it wrong and you'll lose a life.

Screens and screens of budget arcade action. **T:10.**

#### Toucher

*Title: Video Manies. Supplier: Microvision, 5-10 Paul Street, London EC2A 4AM. Machine: C64. Price: £7.99. Originality: 4/10. Playability: 7/10. Graphics: 3/10. Value: 3/10.*

### DOG FIGHT 2187

In the year 2187 man faces his biggest threat as hordes of manning aliens sweep through a split in the space time continuum. Only you, Blast Doctor can stop them.

You manage to steal one of the unbelievable World Corporation's new interstellar fighters and head for the stars. Your mission is to find rare parts of a generator that the ancient ones spread about the galaxy to seal such a split. That's the plan anyway as the ancient and the generator are just part of the planets habitans so you hope there's some truth in that.



Luckily, the stories were true and there are in fact 100 pieces of generators scattered around the stars so finding just one should be easy. It would be easy if you weren't constantly attacked by the alien invaders that are determined you will fail.

The game features a vertical split screen display in which one or two players can join forces against the computer or each other as they blast away at the swirling vector graphic ships.

You have only 30 minutes to complete the game, accompanied by Tony Crowther music. It will push galaxy dogfighters to their limits. **T:11.**

**Touchline**

**File:** Daylight 2087. **Supplier:** Sunlight Software, 68 East Ave., Crown Garden, London WC2N 6AM. **Tel:** 01 636 2417. **Machine:** C64. **Originality:** 5/10. **Playability:** 6/10. **Graphics:** 7/10. **Value:** 6/10.

**ROMULUS**

**B**attling through a bizarre shoot 'em up while competing in sub games is supposed to represent debugging a super computer chip in an arcade game destined for obscurity.

Since Starvo and Robinson are on holiday, it's up to you Nick Bradley, to defuse the ship. This unfortunate task involves surviving an eye-disturbing shoot 'em-up stage in which you're bombarded by missiles and alien craft (bugs?). Survive until the time bar runs out and you qualify for the first subgame (wow). The first thrilling subgame sets to matching colours in three pairs of rotating bars but you must also match their speeds!



If you've survived (the excitement) this far, you can take on subgame two and move the laser base left and right while firing at a bar.

If you like your arcade games to be fast, furious and challenging then forget this one.

T.H.

**Touchline**

**File:** Romulus. **Supplier:** Quindiva, Victory House, Leicester Place, London WC2V 7JH. **Tel:** 01 439 8666. **Machine:** C64. **Price:** £1.99. **Originality:** 2/10. **Playability:** 2/10. **Graphics:** 2/10. **Value:** 2/10.

**GUNSTAR**

**I**f you like your games to be cheap and cheerful then sign up for the Gunstar fleet and defend the Earth from yet another alien attack. The aliens make easy work of the Star Wars defence system and now you must stop them.

There are five stages in this budget but in it which our heroes fight it out with the invaders from space. The conflict begins with an old-fashioned shoot the waddling aliens before they get your game which is followed by a stage in which you must pick your way through an asteroid belt. Next it's a



gunfight with an alien command ship. It takes 90 shots to take out its gun turret and to meet an Alloy robot making more gun turrets. Finally, you must deal with your mother-in-law to select and return for the next alien attack.

A display strip on the side of the screen keeps track of your score, fuel and laser temperature (overheat) and they just as well as a hint screen that gives you invaluable tips such as avoid enemy missiles and don't crash into the asteroids.

A fun game but don't expect too much from it. T.H.

**Touchline**

**File:** Gunstar. **Supplier:** Herbert, Widdowson House, Upper St Martin Lane, London WC2M 6PL. **Tel:** 01 279 6335. **Machine:** C64. **Price:** £1.99. **Originality:** 4/10. **Playability:** 6/10. **Graphics:** 5/10. **Value:** 5/10.

**NOW GAMES 4**

**F**ine games for the price of one is the offer from the fourth in the Now Games series that features the adventures of Dan Dare, the game based on the film Back to the Future, the twilight world of Hacker, the strategic struggle of Mission Omega and a Squash simulation complete with speech.

The C64 version of Dan Dare was widely acclaimed as being the best graphically and featured some superb screens. Now you can guide Dan on his quest to defeat the Melon's.



attempt to destroy the world with an asteroid. Dan must board this hollowed-out craft, battle with the guarding Troons and guide a laser blast through a series of reflecting mirrors to destroy the computer.

Unfortunately, the game is let down by a cut-price combat routine whenever Dan meets a Troon as the battle is resolved by high and low parades.

Back to the Future is a truly amazing game. How anyone can get the rights to a box office smash like Back to the Future and produce such an appalling game is beyond comprehension. Naturally, it features the film's main characters and your attempt (Marty McFly) to ensure you will exist. You've been transported back to the future where you must make sure your father meets your mother who's study in love with you and being chased by the school bully Biff. According to Electric Dreams, this makes the game an arcade adventure in which you must explore only five locations, five objects and talk to only four characters!



Hacker brings to your screen the joys and frustrations of hacking without the constraints. This game's more like the real thing than its 'guide the robots around' Hacker II. The game begins as you dial the wrong number and instead of your usual beeping board you get the message to log on. Log on to what? You don't know the password but even the system you've found but you're determined to find out in an adventure where you find yourself diving deeper and deeper into the unknown.

Your task in Mission Omega is to build a team of robots to explore and plunder an alien spacecraft that's on a collision course with Earth. Earth has programmed missiles to destroy the craft leaving you only a few hours to explore the ship.

Using teams you must build your robots from a selection of bases, drive units, and balance the speed and attack and defence capabilities to its specific job. They can then be controlled manually or programmed to follow defined routes. Inside the alien ship you'll find criteria to challenge your battle robots and parries to baffle your robots in a game that's a mixture of strategy, arcade and exploration.

Finally, Tom's Barrington's Squash is the pick of the bunch and is a fast accurate simulation of the frantic sport. You can play either another joystick wiggling human or four different computer opponents in 3D graphics with Tom's keeping the score thanks to some impressive speech synthesis. The game didn't do too well the first time round in

1985 despite its 3D graphics, speech and fast action gameplay maybe it will be second time lucky as the heavyweight part of this compilation.

In this five game compilation there is one excellent game (Squash), Hacker and Dan Dare that are good. Mission Omega which will pass away a few spare moments and the dreadful Back to the Future. Now 4 also lacks the big game of previous compilations such as Lords of Midnight (Now 1) and The Na Nip (Now 2) and as a result is a weak compilation and just isn't worth the money. Go out and buy five budget games instead.

T.H.

#### Thriller

**Title:** New Games 4, *Supplies*, *Virgin*, 2d Future Kart, *Persimmon Ed.* London 1985, 200k, Ed: 07 727 8070, *Meridian*, £64.

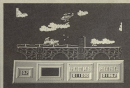
**Originality:** 3/10, **Playability:** 3/10, **Graphics:** 6/10, **Value:** 5/10

#### ARMY MOVIES

Can you believe it? Ocean has released yet another Commando type game, however this is miles better than some versions of the game.

The plot for this game is far from original but, good plots these days are few and far between. You are a member of the SOG (Special Operations Group), a bunch of highly trained tough guys who are ready for almost anything!

Lucked in the manual are some vital plans which, in your hands could cause a big turning point in the conflict between you and the bad guys.



Bracking the stage is no easy task, there are blow-up bridges to navigate while avoiding the enemy jeeps and buzzing helicopters that drop bombs.

Stage two puts you in the control of a deadly helicopter and this time you must destroy the ground bases and enemy, but it's no damned hard.

The next stage has you flying over the sea where you are constantly attacked by submarines. The fourth stage is set in the jungle, here look-out posts will bombard any intruder (you) but these can be destroyed with a well aimed bomb.

On completing the fourth stage you are given a code for levels six and seven which can be loaded separately to save playing levels one to four all over again.

Level 6 has you trapped in a huge swamp, and progress is made by jumping on small islands. You are in the jungle

armed with a machine gun and grenades, huge birds swoop down at you, these cannot be killed. The only way to deal with these is to frighten them off with gunfire. There are also snipers which hide in the bushes and lob grenades at you, all this must be avoided while jumping from island to island. Finally you reach the barracks, this is very hard indeed and it will be a long time before I manage to reach the plane.

Overall Army Moves has a strong addictive pull to it, with nice music and sound effects and some lovely graphics, my only mean with it, is the toughness of the game, younger players should check it out first.

#### Touchline

Title: Army Moves. Supplier: Imagine. Telephone: 081 822 8633. Machine: 64/128. Price: £9.99.

Originality: 4/10. Graphics: 7/10. Playability: 7/10. Value: 8/10.

## SAMURI TRILOGY

Why has Gemina released yet another oriental beat 'em-up? This is the third so far and this is starting to wear a bit thin now.

OK so it is different from the rest but why can't soft ware houses come up with an original title once in a while? Anyway enough of the moans and on with the review.

Deep in the Orient in the province of the Yang River, exists a land of fighting warriors. Highly skilled and deadly, they are the toughest, toughest warriors since Bruce Lee.

On the River Yang is a temple known as the 'Chopsway Temple' and this is where students are trained in Karate.



Karate and Samurai sword fighting. The training is so hard that only the best student will be accepted and if he manages to graduate he will have his name inscribed on the 'Chopsway Temple' wall.

You can choose a number of options including the style you wish to fight in (e.g. Karate, Kendo etc) and whether to fight until death or just have a power run.

In a practice fight you simply try out the various moves available to you, but no points can be scored. In a real fight you can choose your defence and attack points. You can also choose your opponents defence and attack points. The real fight has a minute at the end of which you have a chance to meditate to get back your strength. The methods for

choosing your opponent are the same in all the types of fighting.

After playing Samurai Trilogy for a while I was hooked, the music is far out and really suits the game, the graphics are very impressive and the gameplay is very inspiring, this game really manages to capture the atmosphere which a lot of Karate games do not achieve.

Another impressive thing about this game is the flashy presentation and the original oriental words such as Kata (combination of map punches). This goes to show that some software houses can take their time to research subjects on which their games are based, not just rush the games out as quick as they can or hope it to its teeth like a few houses I could mention.

Well how Gemina, more like this please!

#### Touchline

Title: Samurai Trilogy. Supplier: Gemina. Telephone: 0742 214221. Machine: 64/128. Price: £9.99.

Originality: 4/10. Graphics: 8/10. Playability: 9/10. Value: 8/10.



I hate insects! Not the ordinary spiders, bees and flies but the giant insects that have taken over the city! Driving an Arachnos 4 armored car that's armed with partially tested bouncing bombs you must clear the insects from the city's 25 regions.

The insects are not only outnumber you but are also organized into colonies led by the queen that can produce scouts and probes as quickly as you can kill them. The scouts and probes are sent out to gather food and look for and defend against intruders. The more food they gather the faster the queen can replenish their losses.

To add to your troubles you're not supposed to damage the city and so you have to be careful when you use your bouncing bombs since these carry on bouncing until they hit something. They also bounce a lot slower than the insects move so you have to anticipate where they're going to fly.

Although the insects don't fire back they can damage your car with contact so it's best to keep your distance until you can get your shot in. The Queen is harder to kill and is only destroyed by a superbomb that you can get from your base by radiating your superior. You can also order more bouncing bombs and get your car repaired but you have to

pay for all of this out of your limited budget.

The result is a game that will challenge you, but will soon become repetitive as you have regions after regions of shores, rivers and oceans. The game needs more insects, more action and faster gameplay.

**Touchline**

**Title:** *Steampunk: Sapphire* **Manufacturer:** E-18 **Post Street, London EC2A 4WJ. Tel: 01 377 4880. Machine:** C64. **Price:** £2.98

**Originality:** 5/10 **Graphics:** 6/10 **Playability:** 4/10 **Value:** 3/10 **T.B.L.**

## AUF WIEDERSEHEN MONTY

**H**is out. Good old Monty has escaped to fight again. However, he still isn't safe and this is where you step in.

This game, like the previous Monty games, is simple to play, though it's exciting, and difficult to get anywhere.

Your job is to guide Monty around Europe trying to collect enough money for him to buy his own island.

Monty starts off his journey in Gibraltar but he's got to leave and quickly, as Interpol are onto him. Someone's snatched on him.

To make his escape, Monty needs to collect money and airline tickets which just happens to be laying around, though not usually easy to get at.

In order to get enough money Monty must travel around Europe collecting and selling certain items on his way. As in

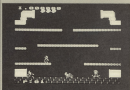
As long as you're into music you can't forget where you are.

If you are a platform game fan you should enjoy this one. It does have a few differences to the norm and an occasional aim behind the game.

So wait upon your geography and go give Monty a hand. **Touchline** 5/42

**Title:** *Am! Wonderblock* **Monty, Supplier: Gamma Graphics, Alpha House, 18 Claver Street, Sheffield S1 4PB. Tel: 0742 737421. Machine:** C64

**Originality:** 3/10 **Graphics:** 6/10 **Playability:** 6/10 **Value:** 5/10



## MARIO BROS

Mario and Luigi are the famous Mario Brothers who clear paths from pipes to make the money for the spaghetti (to be used in an Italian accent).

Mario on his own, or with Luigi in a two player game must clear the turtles, crates and flys from the pipes by flipping them over as they travel along the game's platforms in this conversion of a three year old Nintendo coin-op game. To kill the critters you must get under them and jump up to bend the platform they're crawling along. This will flip them over leaving them vulnerable to a swift kick to finish them off. You have to be quick to deliver this final blow as they'll struggle to right themselves and continue their relentless march. You also have to be careful not to flip them again or they'll be back on the move again.

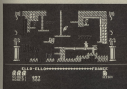
If you clear the screen then it's on to the next level packed with more turtles, crates and flys as well as bulk of the that trick your every move. All is not lost as you can also collect bonus disks and even hit a POW plunger that flips all the enemies on the screen (even those already flipped).

The action is mildly addictive particularly when Mario and Luigi work together (although you wouldn't think it if you heard the arguments about who's that's it was). Unfortunately, looks and plays like an old game that just isn't worth a full pricing. Instead why not look at any of the coin-op conversions based elsewhere in this issue such as *Narcosis* or *Arbansoid*. **T.B.L.**

**Touchline**

**Title:** *Mario Brothers* **Machine:** C64 **Supplier:** Ocean, 4 Central Street, Manchester M2 5SE. **Tel:** 061 831 4435

**Originality:** 4/10 **Playability:** 6/10 **Graphics:** 6/10 **Value:** 5/10



any other game there are many things to avoid. For instance if you run into a bottle of wine you will find Monty in a drunken stupor for a certain length of time, which can of course be hazardous to your health if something is beating down on you.

You need to be a jack of all trades to help Monty succeed. You may be required to fly the Mona Lisa or even enter yourself into a grand prize.

The one difference I found with this game from other platform games is that once you've had enough of one country, as long as you have an air ticket and some money, you can take on a plane and take yourself elsewhere. Extra points may be gained in flight by flying into the planes in front of you.

As you visit each country its national anthem is played.

## FUNGUS

Have you ever been disappointed by a fir tree or a bird? Well if you don't fancy the idea don't offer to guide Fungus while he goes hunting mushrooms inter-galactically. He'll get you into all sorts of trouble.

Fungus is part of a two game pack from Playtex. If you do take the challenge that you'll need to have your wits about you as it is very fast moving. No sooner do you think that you have made a safe landing and start crissing up the next batch of juicy mushrooms when you walk into another trap, or even better, over the top of a cliff.

The writer has introduced a new concept for growing mushrooms, on islands floating about the galaxy, honey, I always thought that they were static. For some reason the mushrooms seem to grow very well in this strange atmosphere surrounded by poisonous trees, lethal clouds and weird creatures.

The idea behind the game is to keep Fungus's craving for Great White Mushrooms satisfied, and believe me that's not easy.

As you leap along from one island to another there are different hazards awaiting you. What makes the game even more difficult is that the islands are in three dimensions and sit at an angle on the screen. This sometimes leads to the impression that you are on the right path to avoid a trap when you end up walking straight, bang into it.

However, even though Fungus is difficult there is no reason why you shouldn't enjoy it, it does have a certain "me more go quality".



The second game in this two game pack is called Fruity. This game calls for a fast case of "watch the birds". No I don't mean grin like a cheshire cat I mean watch the culture that is hovering above you.

Unfortunately this second game doesn't compare at all well with the previous one. The aim is to collect fruit from trees in an orchard and of course, like every other fruit picker I've seen, you do this by keeping up and down via trampolines.

To make life a little harder you don't jump straight as you have to move the trampolines around so that you always land on it, otherwise, you've gone and it, you die.

I found Fruity extremely monotonous. The only variety being the kind of fruit that you pick and the increase of speed with each level.

Being a budget pack I would say that this collection was a

good one for the kids although they may find it a little difficult. For expert game players I don't think that there's much here to keep you occupied for long.

If you like simple but fast games then this may be for you.

**Trouble**

S.G.

**Title:** *Zip Pack - Fungus and Fruity*, **Supplier:** Playtex Software, Culver Park, Aldershot, Beds MK17 9JH, Tel: 87338 7300, **Machine:** C64, **Price:** £4.99

**Originality:** 8/10, **Graphics:** 8/10, **Playability:** 4/10, **Value:** 8/10



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The action takes place on the polluted 3D world of Na Earth that's constantly patrolled by the enemy Neets that will shoot you on sight and even Soubres (your side) who think you're a deserter.

Unfortunately, the action is also desperately slow and features Spectrum like colours and graphics with one of the worst scrolling routines you are ever likely to endure. The game was originally written for the Spectrum which explains the conversion but I feel that C64 owners expect more since their machine has twice as many colours, sprites and three unused sound channels.

A good base for a game that could have been a lot better.

T.H.

**Trouble**

**Title:** *Rogue Trooper*, **Supplier:** Playtex, 4 Little Essex St, London WC2E 8LP, Tel: 01 234 6651, **Machine:** C64

**Originality:** 4/10, **Graphics:** 8/10, **Playability:** 1/10, **Value:** 5/10

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All of these products are now being developed for the Amiga and will soon be available in other formats (C-64/128, IBM/PC, Apple, Atari, etc.)

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# CONTENTS

- Amiga Agony**
**6**  
 Screen Shots, Slow drives and much more in this month's mailbag.
- Fast Flowing**
**8**  
 Got your thoughts into shape with an idea
- Video Stars**
**10**  
 Amiga graphics in the video studio.
- Sounds Fantastic**
**13**  
 We review the Futurosound sound samples.
- Zing**
**15**  
 An alternative to the Amiga Workbench.
- Amiga Games**
**18**  
 We review the latest games software.
- Executive Amiga**
**21**  
 Is the Amiga a business machine or a rich man's toy?

## AMIGA NEWS

### Video Triangle

Triangle Television has opened a new sales department which specialises exclusively in Amiga systems.

Triangle's sales Director, Peter Barrett said: "Our new department offers a full range of facilities, including Amiga sales, and a full range of software with a 24 hour Mail Order Facility. We also offer a comprehensive Amiga training programme for audio visual and business users, and we have an exciting research and development section which is working on a new range of devices to exploit the full potential of the Amiga in the AV and video industries."

Triangle Television is located in South West London, and if you would like to see some of the systems in operation then you may call the number in touchline to make an appointment.

### Touchline

*Triangle Television (35 Abchurch Lane, London EC4N 3JG, Tel: 01 674 3400)*



*RGB Converter from Triangle.*

### Flipside!

Myco-Systems Software, makers of Terminate!, Analyze! and On Line!, has announced the release of Flipside! for the Amiga.

Flipside! performs wide side printing on just about any program that uses

text or HTF files. Compatible with most printers, Flipside! has many unique capabilities. For instance, if you were to create a large spreadsheet with Analyze!, Flipside! will allow you to have unlimited column widths and cells by printing the sheet on its side, as wide as necessary.

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FOR AMIGA  
COMPUTERS

*Alphabet* requires 512K, and its suggested US price is \$59.95. It can also run with all MicroSystems' other Amiga products.

**Features**

Micro-Systems 400-18 Oak Circle, Boca Raton, Florida 33431, Tel: 813/397 5977.

## Earn An Amiga

Analogueic Software is currently running a recruitment drive to find programmers who can write a top 10 game.

As an added incentive to make people come forward, apart from the obvious one of royalty payments, Analogueic is offering writers of new games, whose product reaches the Gallup top 10 a Commodore Amiga 500 worth over £200.

For anyone who writes a game for Analogueic which reaches the number one spot in the Gallup software chart, there is an Amiga 2000 plus hi-res colour monitor waiting to be claimed.

this is worth over £1500.

Analogueic's Peter Clavin said "Analogueic has always had a good reputation for games but we're no longer in the top 10 companies. We aim to get back there, and we want our programmers to share in our success."

**Features**

Analogueic: 12 Chisholm Enterprise Centre, Station Road, Finchley, North London N3 4AA, Tel: 8724 9296X1.

## Games From Pygmalion

Liverpool based Pygmalion has been writing software for the Amiga games market for about two years. The company has recently announced two new launches.

The first is *Barbarian*, an animated fantasy graphic adventure in which the player becomes Hagar the famous dragon slaying barbarian.

His task is to enter the underground world of Dragons which is controlled by the evil Necron. In the underground real there are grotesque

monsters to contend with as well as hidden traps, in the quest to destroy the lair of Necron and claim the crown of the Kingdoms.

The second game for the Amiga is entitled *Overtopps*. It is a strategy arcade game in which the player must attempt to defeat the invading Tripod forces. The action is set against a 3D playfield with perspective scrolling. All defensive and offensive action takes place in a high speed environment where even trading must be accomplished about the clock.

Agility of both mind and hand is needed in this game which covers trading, resource management and defence of resources and your installations in order to achieve your ultimate aim of destroying the Tripods and their leadership.

Both feature artwork by science fiction illustrator Roger Dean and cost £24.95.

**Features**

*Pygmalion First Floor, Part of Liverpool Building, Pier Head, Liverpool L3 1BF, Tel: 011 236 8518.*

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# Amiga Agony

*When you have finally saved up enough money and bought your Amiga, you're bound to find many aspects of your new machine confusing. Here's where you can come for help.*

*By George Dural*

## To Buy or Not to Buy

Having read a great deal of articles on the Amiga, I decided to purchase one. Unlike many readers, I use my computer purely for pleasure, and saw the Amiga as a natural progression from my Commodore 64, which I like to think I have mastered.

Anyway, just as I was about to place my order, I read in your magazine about the new Amigas and particularly about the new A500. Consequently, I have a few questions to ask. Firstly, can the A500 be expanded as much as the A1000? Secondly, will all A1000 software run on the A500? And finally, if the A500 is so similar in specification to the A1000, why is it so much cheaper?

Simon Wright, County Down

Yes, yes and who knows? Firstly, the A500 is, with all due respect to the powers that be at Commodore, an updated A1000 in a different box. It is just as expandable, but all the same parts, and will run all the same software. The only differences there are relative to the power supply and the keyboard/casework.

New Commodore can continue marketing the A500 / one not sure, but in your case I would buy an A500 without any qualms.

## Play It Again, Sam

I am a freelance musician interested in using computers to further the state of music in this country. At the college where I lecture, there are two Commodore Amigas used by the science department for a variety of tests. For the summer holidays I have been able to organize the loan of one of these machines and I was wondering if you knew of either a MIDI interface or some Sound Sampling software that is currently available, and hopefully not too expensive.

K. McMillan, Gwent

The only software of this type that I know to be available now is from Precision Software. Produced by Minotaur, an American company, their products come with both hardware and software.

Although I haven't used either package, I have heard a bit of the samples that can be created and they are, in my the least, spectacular. Precision Software can be contacted on 01 300 7066.

## Slow Train to Go

Having used an Amiga only a matter of weeks after graduating from an IBM PC AT, I have one major problem.

How on earth can the disk drives be so slow? When I am using Logos it is not too bad, but Terraport is parabolically slow. Is there anything I can do about this, or will I have to learn to live with it?

John Burns, Cheshire

AmigaDOS has come in for quite a bit of criticism over the last few years, and none of them more justified than this. Unfortunately, there is very little you can do about it, short of buying a hard drive or swapping back to your AT.

One answer you might look at is the new A2000 with an MMPC compatible board. Using some clever hardware tricks, it has been made possible for users to partition the hard drive, with sections for the PC, and sections for the Amiga. This could provide the ideal answer, although, paradoxically, it isn't so much a cheap one.

## Taking You to Task

Although the Amiga seems to be a very good computer for specific tasks (excellent graphics, good mouse control) the aspect of the computer that should really be causing a stir is surely its multi-tasking abilities. What practical advantage does multi-tasking really bring?

Peter Toolsey, Southend

*Multi-tasking is, in my view, the single most important feature in the Amiga. Users who play games or produce graphics probably won't even notice the multi-tasking, it is only business users who can really reap the true benefits.*

*Although there is a dearth of business software for the A1000, the new A2000 ought to change that, and when it does, a new generation of software ought to become available, all using multi-tasking to simple terms, multi-tasking means that the computer competes in processing time between various so-called tasks. A good example would be that you could print out a document from one word processor whilst writing another on a separate word-processor. Although this slows the computer down, the speed-reduction will leave the Amiga running faster than an IBM PC.*

*Very few packages yet allow the user to make the most of multi-tasking, one exception to this is Scribble which, for all its faults, allows the computer to work in other things, communications for example, while processing a file.*

### Hoorsing Around

*As a gameplayer whose father recently purchased an Amiga, I have found the drought of decent software is slowly but surely ending. However, I still find it surprising that some of the games are of such poor quality. Why is this? Why don't the programmers take advantage of the "Blitter"?*  
David Tovey, London

*This is a very good question, but I'm afraid to say that the answer comes down to money. As yet, there are not enough Amigas sold, particularly in the UK, for many software houses to justify writing games for the machine. As well as this, most games that are released tend to be conversions, almost all of which are identical to the Atari ST version. In many ways this defeats the object of buying an Amiga, and I can understand your annoyance.*

*On the other hand, there are some excellent games starting to appear. Rainbow has added a great deal to Starflight before releasing it on the*

*Amiga, and Popcorn is about to release a host of quality 68000 products. Even with the machine, it will be worth it in the end.*

### Printing by Numbers


*It is all very well me having my Amiga, and being able to produce incredible pictures using Deluxe Paint II, but how can I get colour hard copy? I have tried taking photographs but I continually get thick black lines across the screen, and I only have a Epson FX-60 printer. Any advice would be gratefully received.*

### Niall Stevens, Cardiff

*Without wanting to turn this into a photographic magazine, this is a frequently asked question, and there have been quite a few differing answers. Personally, I feel the answer you can take the slow the better. Use a tripod and open the aperture as far as possible. Then set the speed to around one second and shoot away. Generally these results are good, although the screen does tend to "bend" at the corners.*

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# Fast Flowing

*One of the main uses of computers, it is supposedly their ability to help you organize your life. Flow may be the software that will save writers of all kinds a lot of hassle.*

*By Anne Owen*

**F**low is a productivity tool, one of a new generation of software, often pioneered on the Apple Macintosh, which is designed to aid our creative processes. It is called the *John Proctor* for the Amiga Computer. I have only ever had one good idea so this must be for me.

The disk is accompanied by a classy manual which is designed to go into your Amiga file. It displays all the features of a well planned document which Flow most surely have helped create. Every aspect of the software is dealt with in a step by step manner with reference to the example files supplied on disk. There is a reference section and index for the regular user and a step of card with the function key operations clearly marked to lay across the top of the keyboard.

Flow can be used for mapping out your ideas for any project and I am completing this article in Proctor, having transferred the framework of the piece from Flow. Don't judge the product by the quality of my writing, however! That might be unfair to New Horizons.

I could have used the Flow editor to write the complete piece but I preferred to take advantage of Proctor to complete the review. So I used Flow to create an organized set of facts and ideas which I am now expanding upon. Nevertheless, Flow has some of the features of a wordprocessor with full screen editing and cut and paste facilities to help you get your written ideas into shape.

## Processing

What can Flow do for your ideas? Quite a lot if it helps you lay them out in a logical order so that you and others can make the best of them. And that is what Flow does when you create



what is referred to as an outline. It provides highlights such as bold text and indents to create a hierarchy of ideas. The main idea becomes a heading, its offshoots become subheadings and their offshoots indented text. These blocks can be 'collapsed' into their sub or main headings only or expanded again to display all text on screen. A heading can be moved up or down in the hierarchy as your emphasis changes.

Once your ideas are formulated and organized you can search the outline for a specified heading, you can find matching headings or see the currently selected level of headings in ascending or descending order (alphabetic and numerical). These functions and the text editing functions can apply to the entire outline or just a selected part.

The outline can be printed out as seen on screen or in its full form. Highlights and indents are transferred to the hardcopy. Flow projects can be saved in their own format for safekeeping on disk but they can also be saved in a 'text only' format. In this form they can be transferred to other software packages such as a wordprocessor or page planner or dispatched via electronic mail.

Flow is capable of holding pretty large outlines. The specification is up

to 32667 headings, 32767 indentation levels and a maximum of 200 characters per heading. So your first novel shouldn't be a problem.

## The Best Ideas

Wordprocessors like *Textpad* and *Write* make the changing of text and headings an arduous matter without including but, by providing a custom environment, Flow makes this important on-screen design process so much more organized.

What I do find is that for short or less consequential pieces of writing, I jump straight into a wordprocessor, bypassing Flow. However, when something needs thinking through at the project is a large one, Flow is invaluable for creating a template with which to work. You can print out from Flow, consider your ideas at leisure and return to amend them until you are totally happy and ready to get back on the desktop.

That's the writer's point of view but also bear in mind the database like search and sort qualities (demonstrated in a supplied Amiga magazine bibliography) and the very professional presentation you can achieve for, say a schedule, agenda or management brief. At first I considered Flow a bit of a luxury but it's one I wouldn't now wish to be without.

New Horizons is currently developing the Pro-View wordprocessor and it will be interesting to see if an idea processing feature is incorporated or if that task is left in the capable hands of Flow.

## Finalise

**Name:** Flow. **Price:** £59.95. **Machine:** Amiga. **Supplier:** New Horizons Proctor Software, A Post Town, Worcester Park, Surrey KT2 1AE. Tel: 07 338 7385.

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# Video Stars

*One of the Amiga's many applications is in the field of graphic presentation. But how do you link your computer to your video recorder?*

*By Anne Owen*

For combining computer and video the Amiga has no peers in the microcomputer world. Triangle Television, a company based just down the District line in London SW18, is pioneering the use of the Amiga with professional video equipment. Triangle is a production company with a background in video allowing supply of a complete package, including training in the art of making a video.

## Jigsaw

Triangle is combining the A500 in the role of caption generator with a professional video setup produced by Unison. The A500 supplied is a one megabyte system (using the Alpha J12 RAM-card). The combination has been christened Jigsaw.

Included in the price is software such as *Deluxe Paint 2*, *Deluxe Paint* and *JDK Images' Pro Video* software. *Pro Video* supplies a superb range of on screen fonts which are typed in and laid out in a full screen editor. Font and background colours are selectable. When the 'pages' have been completed, they can be viewed together using a variety of special effects and delays.

The inclusion of the A500 helps make the Jigsaw video system very competitive. The package provides everything you need to complete a video including post production editing and mixing. The hardware includes camera, remote video tape recorder, two video tape players, MSX console and effects/caption generator (A500). Unison's MSX has relation to the micro console already integrates many of the video production functions, such as preprocessing and signal stabilising, cutting down on the inconvenience of cabling and

interfacing. The future may even involve the Amiga in controlling remote video equipment as well as generating images. In the meantime, the latest three dimensional graphics generated using the Amiga will add to the special effects repertoire. There is also the promise of video and computer combination for games and entertainment in the not too distant future.

## Training for Quality

The training support for purchasers of Jigsaw consists of up to four days working with the system and a follow up session at a later date (no "coster" companies to name). Through training, Triangle Television aims to make sure that these systems result only in imaginative, non "unsuccessful" videos!

Current customers include other production companies and colleges which train students in television and video production. Triangle sees the business sector as the biggest potential customer. With Jigsaw and a Triangle

training course, a marketing department should be able to embark with confidence on the creation of videos for publicity, exhibitions and their sale here. I recently bought a product after seeing a video demonstrating its qualities in my own home. Half the homes in Britain now have a video player so there is obviously great potential here. Current video production costs are high and the Jigsaw system could be paid for by just one in-house production.

For those who do not require the full production facilities, Triangle Television also supplies the A500 with various combinations of the equipment mentioned, right down to suitable software and peripherals. There are also training courses on how to effectively use Amiga graphics software for video tiling, starting at £95.

## Video Jargon

Your Amiga quick guide to the video terminology now needed when talking about your Amiga:

Blank -	instantaneous appearance of screen
Checkboxboard -	builds a display out of 'shattered glass' pieces
Fade -	columns fade to background colour
Roll -	the roller blind effect with the new screen scrolling over the top of the old
Reveal -	the old screen slides away to reveal the new one beneath
Roll -	the new screen pushes the old one aside as it scrolls into view
Slide -	the whole screen slides
Tumble -	the screen forms up as bits are randomly dropped into place, starting from the top of the screen
Wipe -	the new screen wipes away the old as it scrolls into view



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# Sounds Fantastic

*Amiga owners with musical leanings are on the look out for packages to aid their electronic expressions. FutureSound from Applied Visions has a lot to offer.*

*By Anne Owen*

A major factor in the success of the Amiga 1000 is the audio hardware, a no compromise solution of digital to analogue conversion producing stereo sound, two 'tracks' per channel, four in all. The AS00 is set to revolutionise the way we play our games. It's going to be a case of 'off with the Walrusian on with the Amiga headset'.

The A200 and hi-fi will have to line together or some nifty 'tech trolleys' purchased. Wouldn't the Amiga technology have been chosen for the new generation of coin-op machines if the sound heads' come up to arcade quality?

As well as pleasing the public, the Amiga helps programmers because, as with graphics, sound can be stored in an IFF format, a standard format interchangeable between software packages, and sometimes even computers. So a library of sounds can be put to use in a number of different ways.

Which brings us to the creation of sounds. The audio hardware can be programmed to automatically retrieve sound data through four channels, each assigned to an eight bit digital to analogue converter. That data can be set up by the programmer (with BASIC SOUND and ENVELOPE commands for instance) or it can be generated by sound sampling. This is where the FutureSound product from Applied Visions comes in.

FutureSound provides the last analogue to digital (outside world to Amiga) conversion to complement the Amiga's D to A output. FutureSound

'digitises' sounds that it receives from one or both of two inputs. The first input is the microphone, which is supplied. The microphone is fairly sensitive, registering the usually inaudible part of the Amiga 1000 fan.

The second input comes direct from a sound producing device such as a radio tape or video recorder, compact disk, electronic keyboard and so-on. You just plug the sound source into the auxiliary input of the FutureSound unit. If both sound sources are plugged in then a 'mix' will result.

The FutureSound box plugs into the Amiga via the printer port, providinga through connection to the printer, which now plugs into the FutureSound unit. A red led on the front panel indicates that FutureSound is active by lighting up. Pressing the button switches over to the printer.

## Software Details

The FutureSound software sets the Amiga up as a sophisticated four track digital tape recorder. Only one track can be recorded at a time but, once recorded, any combination of tracks can be played back.

The all important recording level is set by turning a knob on the front panel of the unit. The recording level is displayed on screen in much the same way as you might see it registered on the front panel of a tape deck. If the ideal level is superseded then the sound display jumps out of the box to alert you. The ideal recording is at the highest possible volume without

causing distortion or 'clipping' - so called because the cut of range frequency is clipped off and remains unrecorded. Once recording has started, the sound level display is suspended.

Each 'moment' of the sound is stored as an eight bit number between -128 and +127. One sample is taken at a time and stored sequentially in memory. The rate of sampling is under software control, defaulting to 10,000 but capable of up to 28,000 samples a second. The faster the sampling rate the higher the quality, the more memory you use up and the shorter the recording time. It is up to the sound recorder to match the quality of the sound with its potential use. A sample rate of 7,500 is roughly equivalent to the quality provided by the telephone. I found that dialogue, either original or punched from films or radio, reproduced more effectively than music.

The tape recorder analogy continues with editing (where all operations except for 'clear all tracks' apply to the currently selected track) and playback (where any combination of tracks can be activated). There are PLAY, STOP, Fast Forward and REWIND controls. The sound track is now graphically represented in a screen window through which you can pan sideways. This movement through the track is achieved in window start steps, with FF and REWIND, by clicking in the window with the mouse, or a Byte at a time for precise positioning.

Editing in fine detail is covered later. A box displays the value of the sample at the cursor position. You may zoom in on the center of the graph window and set start and end points within the track. Playback and special effects always apply themselves to the recording between the current start and end points. These can be reset from the TRACKS menu. Any part of the recorded track can be 'moved' or scaled up (louder) or down (softer).

### Soft Sounds

The *FutureSound* software deals with the boring bits, the file handling, with reasonable efficiency. A data disk is created automatically from the name by placing a 'soundfile' directory on to it. As well as LOAD and SAVE, RENAME and ERASE are also available as a menu so that duplication is avoided.

Loading and saving applies to the

### Sounds Effective

The variety of inputs accommodated means that you can have fun mixing very different sounds for impact, ringing bells and hammer drill for instance. There are numerous sound effects records available to experiment with as well as your own original sources.

Dialogues, especially in stereo proved very effective but



Each track has its own volume control, an on/off gadget and a record/loop gadget. The latter is a source of continual inspiration. For instance you can make short sharp recordings of instruments on three tracks for playing in a loop and one long 'lead' recording on the fourth: track 1: loop "doo wop" drum track 2: loop bass drum beat track 3: loop snare drum beat track 4: once lead vocal

A simple technique for capturing a particular sound is to record for a few seconds, set the start and end markers around your chosen sound, allocate some memory in another track and copy the marked sound over. Instead of copying to an empty (although with memory allocated to it) track, you can mix your first sound into an existing recording on the destination track.

selected track and takes one of three possible formats. The simplest is *FutureSound*'s own format, size of file, sample rate and data. The other two are IFF format, a 'one shot' for recordings that will be played back 'as is' and a three octave option designed for short sounds which will be used as musical notes. *FutureSound* works out the other two octaves which you don't have and, if specified in the graph window, will save a sound with two parts, one of which becomes the sustain element of the sound.

The latter format opens up the possibility of recording instruments under controlled conditions (perhaps with Colson style microphones), saving the samples and then incorporating the sounds into a piece of music or theme tune for a very realistic end product.

incorporating "speedy" into the software is restricted by memory requirements. I don't expect this to stop the programmers achieving it however and the example program supplied by Applied Vision's *Cool Basic* will speed this process.

*FutureSound* is a professionally presented product, from the reliable built hardware to the neat manual with large type and clear diagrams. If you hobby stretches to IFF, or sound sampling is something you need to achieve on the Amiga, then I am unaware of a better way of performing it.

### Touchline

Name: *FutureSound*, Price: £49  
Machine: Amiga Supplier: Applied Vision

# Zing!

*Software for the Amiga becomes more sophisticated by the day. Zing! has the potential to be a must for Amiga*

owners.

*By Anne Owen*

**M**eridian's *Zing!* is not an extension to the current CLI or Workbench. Rather it falls between the two, aiming to retain the user-friendlyness of Workbench but attaching the power of AmigaDOS. Meridian claims 1.25 man years work on the software, so how successful has the design proved to be?

## Multi Useful

*Zing!* has the potential to be many things to many Amiga users. It flies on plain configurations. Firstly there's the ability to move around directories and files on an AmigaDOS disk, carrying out DOS-like commands but without typing commands separately. Secondly, there are the utilities which 99% of Amiga users will find very useful indeed. I had personally been waiting for just such a set of utilities ever since I bought my Amiga.

Application packages for the Amiga often shut out AmigaDOS. If they are run from a CLI window then it is possible to return to that window to carry out a disk management before re-engaging in wordprocessing or pagetting etc. *Zing!* gets around the problem in a much more direct way - the hot keys. The left Amiga key plus the function keys 1 to 9 are set up to, in order, bring up a file system window, a new CLI window, to save the screen to IFF files, to save the screen to printer, to set the screen dimmer time interval, to bring up the disk copy window, the format disk window, to set the *Zing!* defaults and to bring up the *Zing!* hot key window.

The heart of *Zing!* is the file system menu but the screen saver and disk management windows are real bonuses. The *Zing!* defaults are the abbreviated commands assigned to the 10 function keys used in the file system. By default

they can be changed to suit. You can also turn on and off case sensitive and advanced pattern matching - with which the manual deals in a rather obscure fashion. The task monitor is a bit of a gimmick but it is fun to watch the status information being updated as a number of tasks perform before your eyes.

## Disk Filling with Frills

The file system window looks out on your disk files and directories and is packed with information. At the press of a mouse button you can get the current time and date (or past when you are time-stamping files), the system memory available, the files and bytes in the directory on display and which page of the display you are on. You can click from page to page, size the window and scroll within it. At the bottom of the screen are the gadgets representing the current function key arrangement.

You can browse through the directory by double clicking on their names. Selecting 'parent directory' takes you back to the level above.

The 'change directory' window provides a set of device names (those not available are ghosted) to choose from, a requester for the directory name and a CD gadget to make the move. Double clicking on a device brings up a tree window with a list of available directories through which you can move before clicking on your choice. The pathname to the directory is automatically completed for you.

Double clicking on a filename brings up a file information window allowing you to perform rename, delete, edit, type (delete of text) or *My* with forward and backward paging), add a comment file and set the deletion protection flag. You can select

all the files on display for batch copying or deletion. Alternatively files can be matched to a pattern of characters or to before/after a date or day (eg DD-MM-YY, TUESDAY, YESTERDAY).

## Hot Stuff

*Zing!* can display a file tree of any disk complex with a special notation to indicate which depth of directory relative to the root directory you have reached. Commands such as 'make directory' and 'install' can be quickly called up. The file system also provides copy, move, merge and rename functions with the same device gadgets and directory tree available for creating the relevant source and destination pathnames. As with AmigaDOS, comment files are not copied with files. Messages appear at all times to keep you up to date with the current operation. A 'continue or abort' message will appear if an operation proves impossible (eg, a disk is write protected).

Sending files on to the printer is just as much a part of everyday computing as sending them to disk drives. The problem is that printers are slow devices and you have to wait around for them to finish. By selecting files for printing and then calling up the *Zing!* print spooler, you can set the print operation going and then happily place it in the background behind other operations you wish to carry out. The files will patiently queue for the printer's attentions without any intervention from you.

The *Zing!* file system displays the files as they are known to it. It is feasible that other operations may change the status of files so the 'update directory' option should be used to ensure that *Zing!*'s information is right

up to date. The last sorted file display is made possible by 'ring' files, containing a form of indexing. These files are held on disk and you may wish to inhibit their creation on particular disks, a simple matter in the 'setting defaults' window.

### Zing go the Springs of my Heart!

Zing! means that you needn't leave go of your beloved mouse although there is some typing of filenames and there are single key keyboard shortcuts and hot keys. The print spooler and screen dumps are available as far as I am concerned but the file system is what you'll really buy Zing! for if you want an alternative to the CLI. I wouldn't call CLI 'old-fashioned', as Meridian do, rather 'ill-mannered', making its master do all the work! Zing! takes over when the CLI sits back, letting you get more operations out of less typing, more information in less time.

Although Zing! duplicates many AmigaDOS commands, you probably won't want to depress with CLI entirely - after all there are always

batch files to write. Zing! actually uses some AmigaDOS commands so your Workbench disk shouldn't be far away and if you have a single drive system then the Zing! command files will have to be transferred into the c: directory. A good 'view-over' of the manual - which wasn't of the highest standard, although as we told it will be reproduced on a laser printer - is all that is needed since Zing! can be learned as you go along. Cris cards and documentation become redundant in most respects.

Zing! can come halfway into a wordprocessing session or a spreadsheet or into a programming language when normally you would have to go and find your CLI window. If needed it proves possible to get back at all without closing down what you were doing. Zing! also comes to the rescue if non-Workbench files abound and you aren't about to learn all the CLI commands off by heart. In a perfect world Workbench would do all this. Zing! takes a more practical approach and succeeds in making

AmigaDOS a more viable working environment.

Meridian president, Jerry Farmer, tells us they plan to update Zing! on the advice of users, that they offer a technical hotline and respond to written enquiries. A further product Zing!Keys, an Amiga keyboard enhancer which enables the user to assign macros and hot keys, is now due for release.

**Timelines:**  
Name: Zing! Price: £79.95 (\$80.00 + p.p.)  
Hardware: Amiga. Supplier: Meridian Software.

### New Start

The new version of Etkasort was cropping out into Commodore Amiga dealers at the time of writing. In the meantime software has been appearing with patches for 1.1 versions of Etkasort. Zing! however, is an example of new software which requires Kickstart version 1.3 to work, a potentially frustrating situation which users should be able to resolve by contacting a local dealer. ☺

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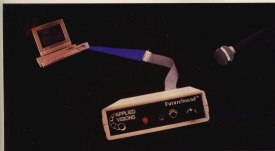
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# Amiga Games

*There's nothing like sophisticated graphics and sound to enhance a game and the Amiga has both. But does the latest selection of games live up to this potential?*

## S.D.I.

**N**ow we all know what nasty bradders these Russian chappies are. They only have one aim in life, and that is to bring about a state of global communism with as much vicious brutality as is infamously possible.

What a good thing it is then that we have our heroic American conspire who are bravely prepared to fight for truth, freedom, apple pie, and the American Way. In S.D.I., one of the first offerings in Mindscape's Commodore range, delegately giving players a more 'adult' experience, you, dear reader, play our Skous McCormick, Captain of the US Official Marines, whose task it is to save the human race.

This, it must be said, should be easily accomplished before lunch. It is simply a matter of preventing a group of 'KGB-led fanatics' from starting a nuclear war. The redoubtable McCormick must destroy all KGB attack fighters, defend America from missile strikes, and rescue his beautiful Russian lover from a 'barbaric KGB torture squad'.

Judging by the picture in the accompanying booklet, I



would be tempted to leave her to her hideous fate, and try off in my Starfighter for a couple of hours.

Although the scenario is one of the worst I have ever read, the actual game isn't quite that bad. Admittedly there is very little gameplay, but counteracted against that are some spectacular graphics and sounds that would not be out of place in Star Wars. The animation too is excellent, particularly during the section where little user participation is necessary.

Overall, S.D.I. is a very American game. To describe it as such he would be the biggest understatement of the year. If you can ignore the politics you might find a good game. I just couldn't keep going for that long. G.B.

### Touchline

Name: S.D.I. Supplier: Mindscape. Machine: Amiga. Price: £39.95.

Originality: 6/10. Graphics: 8/10. Playability: 5/10. Value: 6/10.

### Unlimited

**M**indscape, the company that brought such adventure classics as Deja Vu and the King of Chicago, has combined again with Atari, to create a new classic, Unlimited. Games fans that with Deja Vu will immediately feel at home. Large windows, full mouse control, and lavishly descriptive all add up to create a game which is the computer equivalent of a good Davidoff (Blatney) novel.

In this particular game, you take on the role of a car crash victim, left alone in the countryside, with only a large house in view. As you approach the house, which in fact turns out





is the mood of a gothic manorosity than a semi-detached, an anti-looking corner over you, one which is inevitably conferred when the front door slams shut (and locks) immediately after you enter.

Walking around the house, it became clear that this is by no means your average bed and breakfast, especially with shadows lurking in every corner. To make the most of the feeling of impending doom, Mindscape has included a whole lot of elegant sound (most of which are static on the Amiga) ranging from creaking doors to horrific screams—something like me when forced to watch Backyard.

The graphics are not spectacular, particularly by Amiga standards, but they do serve their purpose, which is to add to the feeling already created by the text. This is not a game for impetuous adventurers. It may be simple to play, but it is no easy feat. Many hours spent with my mouse and I have still not so beat the maze, a part of the game which is so interesting as to have forced me to turn the machine off in a huff!

One American word magazine voted *Unleashed* the equivalent of an Oscar, and it is obvious why. The game is a clone of the graphics-adventure genre. I am sure you do know British adventures, but this game puts into the shade all but the very best *Legend* and *Magnate* Scrolls games. If you like adventures, you had better not miss *Unleashed*.

G.J.B.

**Title:***Chessmaster 2000***Name:** *Unleashed, Supplies, Mindscape, Machines, Always Available***Developer:** 8/10 **Graphics:** 7/10 **Playability:** 8/10 **Value:** 9/10**Chessmaster 2000**

Every computer needs its chess game and *Chessmaster 2000*, by the Software Taskforce, is the outstanding offering for the Amiga. There are two elements to the computer chess game, the aesthetic and the practical. *Chessmaster* scores highly on both.

A beautifully presented game, *Chessmaster* almost works on all options. Choose two or three dimensional display, rotation of the board, board coordinates on or off, voice, music, full or silence. The pieces are finely drawn, snap between novel or realistic finish, define all colours precisely with slider controls.

The display is a joy to look at and all the options are selectable from pull-down menus. In general, *Chessmaster* is impressively programmed in the Amiga style. It's fast too, often continuing to play computer moves while the player chooses a menu option.

You can choose your opponent, human or *Chessmaster* or watch an autoplay game. You can choose to play black or white, to show captured pieces or to have chess clocks on screen. Newcomers have their own style which forces 'easy mode' on. There are normal coffee house and best move style and you can have the 'opening book' on or off. You can choose from levels one to 12 (level 1: 30 moves, five minutes; level 12: one move, 6000 minutes). During play you can force the computer to make a move, take a move back or replay it.

You move a piece by dragging it into position with the hand icon. Grey silhouettes will indicate possible valid moves, turning red to indicate a possible capture. *Chessmaster* won't let you make an illegal move. You can file away your own games on disk (load, save and cancel) and there are an amazing 180 games in the 'classic games' directory for retrieval and move by move replay or analysis.



Those who like to get serious about their chess will be happy to learn that *Chessmaster* does too. *Chessmaster 2000* was winner of the 1996 US Open personal computer chess championship.

Each game is recorded so all moves can be replayed, taken back and analysed from any position. An analysis can be saved to disk, moves displayed or printed out as you play, or on completion of the game. You can set up any position, ask for suggested moves and best variations. *Chessmaster* will solve to mate for either player or give an indication of how long you've got left! You can even watch *Chessmaster* 'thinking' although this display obscures too much of the board for my liking. I'd prefer to have both.

*Chessmaster* has the range of options to keep the serious beginner, occasional player or club competition happy. Bill Raymond and Jeremy could happily use it to iron up chess analyses on television and I bet Gary Kasparov would like to get his hands on an Amiga for his Black Sea chess.

A.J.

02/17/97

**Title:***Chessmaster 2000***Name:** *Unleashed, Supplies, Mindscape, Machines, Always Available***Developer:** 8/10 **Graphics:** 7/10 **Playability:** 8/10 **Value:** 9/10



# Executive Amiga

*Does the Amiga live up to its claims to be a business machine? And if so, is there sufficient software support?*

*By Anne Owen*

**L**ike it, or isn't it? The A2000 is supposed to be and the A500 is supposed not to be. I'm talking of course about 'a business computer'. Classmates, embarrassed by the combination of graphics and sound (games) and multitasking operating system (business), have sorted out their marketing by splitting the A1000 into two.

The A2000 now has Amiga and IBM also capable of taking, respectively, business participations and processors able to run traditional business software. We are yet to find out if this latter feature is just a get out clause for those who want to let their jobs by buying IBM. And does it matter anyway as long as it sells Amiga's?

In the meantime those of us who need no excuses have been getting to know some of the excellent software available for the Amiga office. All of it will run on the A2000 as well as the A1000 and A500.

## Markers Unite

Many computers have desktops. On the Amiga you sit at a Workbench. The Workbench has the available tools laid out on it. If *Analyst's* spreadsheet is in one disk drive and your click titled 'Spreadsheet Data' is in the other then two disk shapes (icons) with these titles will appear on screen.

To click on an icon you place the mouse controlled pointer over it and you press the left mouse button twice. If you click on the *Analyst's* disk it will open a window and display its

contents, the program itself, any utilities associated with it and any data neatly stored away in named 'drawers'. Each item has its own icon picture so you can't mistake its purpose. To check the contents of drawers you click on the appropriate icon. A further window will appear with its files and perhaps more drawers to open and inspect. A filing cabinet by any other name, but no need to move from your bench!



When you click on a program icon, say the *Scrabble's* word processor, it will create its own working environment on the screen. *Scrabble's* has its own pull-down menus, a place to type your work and responders to ask you what you want to do next, the name you wish to give your text file and the drawer to put it in when you save it. Everyone, however little they know about computers, will be able to use a package like *Scrabble* within minutes. Online 'help' files mean that only the finer points of use will have to be looked up in the manual (which is undoubtedly extremely comprehensive). The *Plan* series of software and

*Creator's* *Logician* both feature disk based help files. So Amiga Business software presents a friendly face.

## More Than Two Hands

The Amiga is capable of running more than one such program at the same time. With the 512K machine this is more showing off than practical. More useful and more lovely, you will want to run a mental task like backing up a drawer of valuable files while continuing with your spreadsheet or database. If you are running *Analyst's* or *Organizer's* in *Superbase*, all you have to do is reduce the size of the window containing the program and click in the Workbench screen which is revealed behind. You can create a backup drawer by simply renaming an empty drawer icon. Now click once on your drawer (full of files) and, holding down the left mouse button, drag it over to the drawer named 'backup'. At this point you let go of the left button. Workbench now knows that you want to copy one drawer into the other. You can now return to your previous task, resizing the window again as required.

Workbench is very easy to use but it has its weaknesses. Suppose you wanted to print a document or series of documents. There is no printer icon on the Workbench in which you could move your document drawer. Programs such as *Scrabble's* will help you out with printing tasks but some are not so helpful and you may have to learn some *AmigaDOS* commands or turn to a utility such as *Zog's* which provides printing in the background.

## Office Suit

All the major business applications are available for the Amiga. The new 2.00 version of *Scrabble!* from Micro-Systems Software is now a very good wordprocessor and can shoulder the hard work demanded of this essential office tool. The mail merge feature is nearly implemented although more information about how to interface it with database files would be helpful. The spelling checker, with a 14,000 word dictionary and a simple way to 'teach' the dictionary new words, is fast enough to encourage its regular use.

*Scrabble!* also proves the real usefulness of multitasking by allowing the writer to have up to four documents open on screen at the same time. The cut, copy and paste tools all work across the documents so you can combine the hard thought-out wording of your sales brochure into your latest newsletter by just copying it over.

A range of paper handling and text formatting commands can be inserted into the text, variable strings inserted automatically from specified disk files or prompts generated from input from the keyboard. These features are the key to the modern requirement of 'personalising' correspondence. Now all you need is a laser printer to do justice to the different styles of text that you can see on screen. Styles can be changed at any time without rekeying.

Still with Microsystems Software, the *Analyst!* spreadsheet makes excellent use of the Amiga's user interface. I find it very easy to both enter data and manipulate the layout using the mouse as a pointer. You can insert and delete columns and rows simply by making a selection with the mouse. Labels can be set out over multiple columns widths for legibility. Moving and copying is achieved by holding the mouse and point roller icons to highlight the data required and pointing to where it should go. Dead easy.

Keyboard "/" commands and pull-down menus provide access to the functions. *Analyst!* features a large array of functions, a macro language for automating your work and a neat set of graphs which are generated from selected data sets. The graphs are controlled from a pull-down menu in *Analyst!* and do not require a separate

utility. The business person will find the software easy to get used to and the excellent manual will guide them into the more powerful features. Its 200 pages, spiral bound, immaculately typeset with example screens, glossary, index and appendix on the latest features, it reflects the all round quality of *Analyst!* and I was most impressed.

*Superbase* is the main contender in the database stakes and we previewed it in the first Four Amiga. Its special ability to handle external files containing graphics is not the only factor that sets it apart in quality from other database software so far encountered. There are a variety of ways provided to display your data as well as sophisticated searching, sorting and indexing functions.

Because it's the Amiga, it's worth looking at business presentation graphics. If you want to take presentation graphics a step further than the integrated graphs of *Analyst!* then *Amiga Impact* is designed for you. It provides a whole range of graph types to represent your data. Other point packages do have clip art to help the creation of graph images but *Impact* is purpose designed. Once the images are created, you can 'program' a click show to display them.

There remains the problem of presenting the finished product. The computer itself may not always be available. The *Polished Picture* is an expensive solution if 'cut off' graphics are required. A company that is already producing business graphics on slides, from a client brief or from EPP format supplied screens, is Phoenix (Tel 0733 768990, Triangle Television (01 874 3418) will also help you produce a video if that's what is required. A colour printer is expensive for a one-off but a model such as the Xerox gives remarkable results if hard copy is a requirement. A cheaper alternative is the Ultimate 30.

## Communications

A quick word on electronic mail, now a very real requirement of a business computer. The Amiga can share in this department with a number of public domain programs to give you a taste and with *A-net* the outstanding commercial program from America. *A-net* will combine with the appropriate modem to take you on to

Telocator, Gail or One to One and will help automate the process of dialling and logging on. If you want to access American electronic databases then *A-net* is ideal.

## Data

Data integration remains one of the weak points of the Amiga compared to some of its (much more expensive) rivals. As yet there is no 'clipboard' for cutting and pasting data between programs.

An interesting feature for the business user is the ability to incorporate data from IBM compatible software. A special program can read the data and write it back to an Amiga format disk. *Analyst!* has a third Lotus EPP option for such circumstances. It's very 'round the houses' by this method. The A2000 tackles the problem seriously with its 8888 co-processor and offers cut and paste between *MSP05* and *AmigaDOS* as they operate side by side in separate screen windows.

One further problem which you might encounter as an Amiga executive is the storage media. The 3.5" disks are robust but the Amiga drives seem especially unyielding. Frequent backing up of data is essential. Note that both *AmigaDOS* and *Wordtouch* rely on program code stored on disk. A single drive system will require the frequent swapping of disks. If you however large amounts of data being handled by your business application then look seriously at a hard disk from the beginning. Like GEM, hardware is made for hard disk.

## Touchline

Name: *Scrabble!* Price: £58.00 Name: *Analyst II* Price: £149.00. Machine: Amiga. Supplier: Micro-Systems, 28 Aylesham Information: Helen Frobeniusley Ltd, 24-25 Abbot Street, Croydon, Surrey. Tel: 01 360 8692.

## Touchline

Name: *Superbase*. Price: £129.95. Machine: Amiga. Supplier: Precision Software. Tel: 01 350 7565.

## Touchline

Name: *Amiga Impact*. Price: £64.95. Machine: Amiga. Supplier: Amiga Development, 2315 Pine Avenue, Santa Monica, CA 90405. Tel: 7 113 383 9972.

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# Listings

Get it right first time with our deluxe program system  
for the C64.

You may have noticed that our listings are free of those horrible little black blades which send you searching around the keyboard for a suitable graphic symbol. You may also have noticed the fancy numbers by the side of each line of the listing. First no more, it's all part of our easy entry aid.

Instead of those nasty graphics and rows of countless spaces in PRINT statements and strings we use a special coding system. The code, or mnemonic, is always contained in square brackets and you'll soon learn to decipher their meanings.

For example, [SA] would mean type in a Shifted A, or an ace of spades in layman's terms, and [RAM] would mean a row of ten of those symbols.

[S+] means hold down the shift key and press the plus key once. It doesn't take a great leap of logic to realise that [C+] means exactly the same thing (except that the Commodore key (bottom left of the keyboard) is held down instead of the shift key).

If more than two spaces appear in a statement then this will be printed as [SPC4] or, exceptionally, [SPPC4]. Translated into English this means press the spacebar four times or in the latter case hold the shift key down while you do it.

A string of special characters could appear as:

[CTRL N, DOWNLEFT, BLUE, FLIC]

This would be achieved by holding

down the CTRL key as you press N, press the cursor key down twice, the cursor left key five times, press the key marked BLUE while holding down the CTRL key, press the F1 key and, finally hold the Commodore key down while pressing the number two key (C2) would of course make the computer print in brown.

Always remember that you should only have a row of graphics characters on your screen with no square brackets and no commas, unless something like this appears:

[SS][C\*]

In this case the two characters should have a comma between them.

On rare occasions [REV T] will appear in a listing. This is a delete symbol and is created by entering the line up to this mnemonic. Then type a closing quotation mark (SHIFT & 2) and delete it. This gets the computer out of quote mode. Hold down CTRL and press the number nine key (NINE), type the relevant number of reversed T's and then hold down CTRL and press zero (ZERO). Now type another quotation mark and delete it again. Now finish the line and press RETURN.

A list of these special cases is given in the table but remember that only one of these mnemonics will appear outside of a PRINT string; the symbol for pi. This may appear when its value is needed in a calculation so this may look something like:

CC=C\*(PI)\*R

(Ignore the square brackets and just type in a shifted upward pointing arrow (ie. the pi symbol).

## PROGRAM: Double Average

1 REM \*\*\*\*\* DOUBLE - BASIC SOURCE

20 DIM A(10), B(10) : REM \*\*\*\*\*

30 FOR L=0 TO 9 : GOTO 100 : NEXT L

40

50 READ A(L) : IF A(0)=0 THEN GOTO 100

60 IF L=0 THEN GOTO 100 : GOTO 70

70 B(L)=A(L) : GOTO 100

80

90 READ B(L) : IF B(0)=0 THEN GOTO 100

100 NEXT L : GOTO 100

110 PRINT "A: ", A(0), A(1), A(2), A(3), A(4), A(5), A(6), A(7), A(8), A(9)

120 PRINT "B: ", B(0), B(1), B(2), B(3), B(4), B(5), B(6), B(7), B(8), B(9)

130

140 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

150 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

160

170 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

180 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

190

200 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

210 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

220

230 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

240 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

250

260 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

270 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

280

290 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

300 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

310

320 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

330 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

340

350 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

360 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

370

380 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

390 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

400

410 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

420 DATA 100, 100, 100, 100, 100, 100, 100, 100, 100, 100

by Eric Doyle

## Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum values and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line checking program.

Type in the Checksum Program, make sure that you're not making any mistakes and save it to tape or disk

immediately because it will be used with most of the present and future listings appearing in Your Commodore.

















At the start of each programming session, load Checksum and run it. The screen will be covered with yellow characters and each time you type in a line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

















If the two values don't relate to one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and

press RETURN again.

If you want to turn off the checker simply type SYS49132 and the screen will return to the familiar blue colours. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum lies you can go back to it with the same SYS command.

No system is foolproof but the chances of two errors cancelling one another out are so remote that we believe our listings are more reliable than any other magazine in the world. So get typing! 

Mnemonic	Symbol	Keypress
[RIGHT]		CTRL left/right
[LEFT]		SHIFT & CTRL left/right
[DOWN]		CTRL up/down
[UP]		SHIFT & CTRL up/down
[F1]		F1 key
[F2]		SHIFT & F1 key
[F3]		F3 key
[F4]		SHIFT & F3 key
[F5]		F5 key
[F6]		SHIFT & F5 key
[F7]		F7 key
[F8]		SHIFT & F7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[RETURN]		CTRL & 9
[BASDFN]		CTRL & 0

Mnemonic	Symbol	Keypress
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[POUND]		£
[L-ARROW]		←
[R-ARROW]		→
[F1]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		see text
[Clear]		CBM + letter
[Store]		SHIFT + letter

# Coin-Op Conversions

*Many of the most popular computer games were originally designed for arcade machines. We look at some of the most memorable old favourites and bring an update on the latest in this area.*

*By Tony Herberington*

Computer games as we know them began life in the arcades and since then the software houses have often taken their leads from their coin-op cousins. It all started at an early pace with *Pong* providing the game that sold many home game machines. Then came *Space Invaders*, *Asteroids*, *Bertrout*, *Dynasty* and *Demons* with conversions appearing for all systems including the C64 on both computers and coin-ops (described below). The early coin-ops had black and white screens with coloured strips (such as those). Now C64 owners can get their own copy of games like *Demons*, *Paperboy* and *Demolite* and even video disk games such as *Dynasty's Lair*!

Most coin-op conversions are surprisingly good when you consider that the arcade machines have hardware and graphic specifications that would put the Amiga to shame, such as a 68000 processor and about two megabytes of memory!

## Elite

One software house that has made its name in coin-op conversions is Midlands based Elite, well known for their



*Elite* (Amiga)



*Demolite* (Amiga)

games such as *Commando*, *1942*, *Ghosts and Goblins*, *Bombjack* and, of course, *Paperboy* and *Space Harrier*.

*Paperboy* is one of my favourite coin-ops and my first call whenever I'm in an arcade. The unique gameplay consists of delivering copies of *The Sun* to subscribers while avoiding an army of drunks, skate boarders, motorists, footmen and animals that are determined to wreck your BMX bike. You can tell the difference between subscriber's houses and the others as your readers have bright clean houses whereas the others are dark, cobweb ridden hovels and you even get bonuses for breaking windows by hurling your paper through them. I wonder how many other people practice on the computer game so they can avoid them in the arcade.

*Bombjack* was in fact a bigger hit on the C64 than it was in the arcades and has prompted a sequel. Unfortunately, *Bombjack II* restricts the jumping hero of the original to straight left, right, up and down movements and the game to a limited platform game.

*Space Harrier* is perhaps one of Elite's most ambitious conversions since the C64 can't hope to match the coin-op's stunning graphics. Although these look like a poor pair





Wing Wars II

imitation, the game retains the frantic flavor of the ultimate shoot 'em up.

Commando was the first controversial coin-op conversion as Elite took a dim view (and threatened legal action over Atlanta's *Wing Wars II*) which was so severely similar to and the geography of this 3D shoot everything that moves game. This was the first coin-op to be officially licensed instead of a general free-for-all with the closest to the original attracting the threat of a lawsuit from the likes of Atari taking suit (all pipe adds to threaten everyone). In the end Commando topped the charts (*Wing Wars II* didn't), proving the original will win in the end.

### Clash

Two other games that suffered similar clone fever were *Marble Madness* and *Gunster*. These two hotly pursued battles, both resulting in amazing games, led to light off clone competition launched before the official versions. At one point, it was said that the market would be saturated with marble games such as *Spindizzy* (Electric Dreams) and *Gyroscop* (Melbourne House) and *Gunster* games such as *Snort* (Mastertronic), *Dandy* (Electric Dreams) and *Dread* (Papyrus). But both official games did remarkably well, with *Gunster* taking the lucrative Christmas number one position.

### Spot Simulations

Sports games have been few and far between in the arcade but those that have appeared have had a dramatic effect on the software houses. Melbourne House captured the flavor of coin-op kang-fu games in *Way of the Exploding Fox* and started a craze that has lasted three years. It has since been followed by official conversions of *Tie-Fu Kong Fu* (Imaging) and *Kang Fu Master* (US Gold).

The greatest influence has got to have been Konami's *Frenzy* and *Frenzy* that first sparked off the joystick juggling athletics that lead to *Jojo Thompson's* *Overnight* (Konami), *Reinforce* (Activision) and of course the Epyx quartet of *Summer Games*, *Summer Games II*, *Winter Games* and *World Games*.

Atari's coin-op gold amazed the world and challenged programmers to create true 3D views of the course. This

challenge was taken up by Aristonsoft who produced the incredibly accurate *Atari Conversion Set*, in which you play on four real courses, and the hit and hope games of *Leader Board*, *Leader Board Partners* and *Leader Board Executive*, imported from Access by US Gold.

### Graphic Displays

The most spectacular coin-op conversions must surely be *Dragon's Lair* and its sequel *Escape from Sarg's Castle*. How could a humble C64 hope to mimic a video disc machine capable of producing cartoon quality graphics? The result was surprisingly accurate, helped by the simple gameplay in which left and right joystick movements decided whether the hero, Dirk, the Darling survived another stage to rescue his princess or got fired, thumped or plummeted in the attempt. Curiously, I found the sequel to contain the most familiar screens including the perform role down the waterfall and rapids, a frantic trip on a flying horse and a chase down a tunnel with a giant boulder just behind you.

### Old Favorites

Just when you thought that things were progressing nicely via *Pong*, *Arkanoid*, *Kang-fu* games, *Gunster*, *Papyrus* and *Dragon's Lair*, *Breakout* makes a comeback!

One of the early coin-ops is back as *Arkanoid* Rescued, rewritten and reworked. The task of hitting a ball with a bat to break down a wall has become a bit harder as always get in your way and some bricks don't break but give you unusual bonuses such as a double hit and gas makes the ball stick to the bat. Ocean has done the official version but Syntron has produced a clone in *Koolha* that adds screen after screen of bricks that are guarded by more active aliens that not only deflect the ball but also paralyze your bat and waste even eat the ball and spit the bats at you!



Arkanoid

### Infinite Variety

*Amuse Games* (Achuarc) features a compilation of indoor sports such as 10 pin bowling and darts and also air hockey, a machine that lures in the corner of most arcades. The object of this amazing game is to guide a puck that bounces on a cushion of air into your opponent's goal without smashing your knuckles. Incredibly the compact version captures the

gameplay, the speed and smooth movement of the machine but without the pain.

There are one or two computer games that have actually managed to travel against the flow out of the arcade and have been converted into coin-op games! *Thunderbolt's Chopper* was a hit on a variety of machines, including the C64, before it moved into the arcade where it was revamped and improved and is now almost unrecognisable thanks to its superior graphics.

The coin-op version of *Arcade's Pitfall* actually consists of a mixture of *Pitfall* and its sequel *Pitfall 2* with added crapping volcanoes, lightning and other graphic effects.

Not many games make this transition as they have to be good enough to encourage people to pay 20p for a game (even though they might already have the computer version) and be quick enough to juggle as many games (and 20ps) as possible into a day.

The coin-op conversions continue with three this month. *Nemesis*, *Express Raider* and *Gauntlet: The Deeper Dungeons*.

## Nemesis

*Nemesis*, an Earthlike world is under all-out attack from its ancient enemies the *haxtorians*. To save them you pilot the prototype Warp 8 inter-space fighter and deal to the death with the *haxtorians*.

Your objective is to *haxtorian* superlenses but first you will have to battle just swarms and streams of amazing alienlike ships, gun towers, fighters, exploding rocks, tailed monsters and marine ships that have to be blasted four or five times down their central shafts before they shatter you in minutes.

The action is based around bizarre landscapes in which deep space guns may be built up ships, strange pipe constructions, walls that must be blasted, platforms with giant hands and huge structures complete with gambling devices.

As you rock through you'll be able to collect power capsules that wipe out the mines on the screen and others that can be used to improve the Warp engine. Collect enough and you can increase the ship's speed (and avoid a lot of trouble), equip the ship with up to surface missiles, double the fire power of the cannon, replace the engine with laser, protect the rudder with a shield and add up to two side-riders. These have the same firepower as the rudder and form a tail behind your ship.

One of the best shoot 'em ups you've ever likely to play.

### Titleline

**Title:** *Nemesis*. **Supplier:** *Asmodee*. **Machine:** C64.  
**Originality:** 4/10. **Playability:** 8/10. **Graphics:** 8/10. **Value:** 5/10.

## Express Raider

The wild west comes to your C64 in the conversion of the Data East 'get the train' coin-op.

Bands of *Kang-fu* are persecuted by gunfights from horseback as you battle to get to the front of the train. The *Kang-fu* takes place on top of each carriage to which you must punch and kick gun firing guards, shovel-wielding robbers, assorted cowboys and cowgirls (7). The battle must

be won within a time limit otherwise a life is lost which means the pressure is on particularly against one opponent who hides behind a pile of boxes that must be punched and kicked away before you can tackle him.

On horseback you must shoot seven passengers in each carriage in succession to the next level. This isn't as easy as it sounds as your intended victims have helmets and knives at you.

*Express Raider* is somewhat disappointing and has nothing new to offer as it's little more than yet another *Kang-fu* game. Isn't it time for something a little different?

### Titleline

**Title:** *Express Raider*. **Supplier:** US Gold. **Date:** 2/1. **Machine:** C64. **Originality:** 2/10. **Playability:** 3/10. **Graphics:** 6/10. **Value:** 5/10.

## Gauntlet - The Deeper Dungeons

When the four player relaying action of *Gauntlet* appeared in the arcade the owners had to stop people playing the game so they could go home at night. It was also the first machine to have a slot to take the pound coin as players shovelled money in to keep their characters alive.

The game was successfully converted for the C64 and included all 512 levels. Now here's the sequel and another 512 levels for Merlin the wizard, Quaxxon the elf, Thor the warrior and Thera the valkyrie to explore and plunder.

The deeper dungeons look a lot from the original game (which you must have) and feature the same combination of monsters, magic and mazes in which the players must fight ghosts, goblins, devils, lobbers and scorpions to get to treasure, potions and invisibility amulets.

Some of these new levels have been designed by Gauntlet players as entries in a design challenge competition and are particularly nasty. For example, one screen begins with a dial with six *devils*, another an assault by lobbers and all have an unshakable stack of poisoned food.

If you enjoyed the original *Gauntlet* (if not, why not?) then you'll relish another 512 levels which could be training for things to come as *Gauntlet II* is now in most arcades.

### Titleline

**Title:** *Gauntlet - The Deeper Dungeons*. **Supplier:** US Gold. **Date:** 2/1. **Machine:** C64. **Originality:** 8/10. **Playability:** 9/10. **Graphics:** 9/10. **Value:** 9/10.

Coin-op conversions will continue to top the charts as more and more games join the ranks on your C64. The next big game is likely to be *Quaxxon* from Electronic Dreams, a four player *Gauntlet* style science fiction game which will be joined by *Super Sprint* for our money fans.

US Gold is preparing a trio of conversions featuring the heroes of Indiana Jones as *The Temple of Doom*, the cartoon capers of *Road Runner*, as well as the attempts of *White Cliffs* to turn him into fast food, and finally *Myra Cross* which is a desperate race against time across an 8000 course packed full of springs, gun wheels and spiked balls that try and separate you from your trusty state-board. It

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Figure 1: Drawing of a house.



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# Programmers Package

*Speedopen and Programmer's Utilities are two new products from JCL Software. Do they come up to scratch?*

*By Allen Webb*

**J**CL has recently launched two new software utilities. *Speedopen* is a word-processing package while *Programmer's Utilities* brings you three different ways to improve your own programs.

## Speedopen

As implied by its name, *Speedopen* is a word processor package. It was originally available on disk but has now been converted to cartridge. The area of word processors is fraught with difficulties since, in my experience, a word processor is a very personal item about which one readily evinces preferences and prejudices. It is, therefore, difficult to review a word processor objectively. At under £28, *Speedopen* is clearly in the budget area and must be considered in that light.

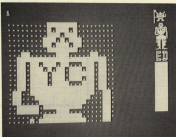
The one virtue of cartridge based software is that it boots up automatically without bother or delay. *Speedopen* is in this category and after a mildly self-indulgent opening display, an opening Help screen appears.

On first impression it seems that no effort has been spared to make help readily available so that you can perform most general functions without constant recourse to the manual.

## Facilities

The big pain when using a WP on the 64 is the limitation of 40 character screen width. Software writers tend to adopt one of two solutions:

1. The edit screen uses 40 character



width but you can preview text in its correct form before printing.

2. The use of What You See Is What You Get (WYSIWYG) format with the screen acting as a window on the document.

*Speedopen* uses the latter option in a fast and effective manner. My personal preference is for the first approach, mainly because it makes the check reading of the document simple. It's really a question of taste.

The author of *Speedopen* seems to have adopted a happy balance when it comes to the features embedded in the package: the usual options for text format are available; justification, centring, tabs, word wrap,

Markers which show where the pages start and end are provided but there are no options for adding footers or headers. The usual options for moving and deleting blocks of text and word searching are also provided.

One welcome feature is the provision of a built-in Centronics driver which allows the use of parallel port printers without aggravation. My main grouse is the repeated request for information during data handling and other options. Whilst I applaud the provision for drive numbers for those with twin disks, a global hardware option would reduce key pressing.

As a budget WP, this package has most of the options I would expect. It

is both fast and efficient without any obvious bugs and I would recommend it to anyone wanting to start handling text in a serious manner.

### Programmer's Utilities

To someone, such as myself, who enjoys hunting through public domains and similar compilations of software, the new item offered great attractions. This is a collection of three programmer's utilities. I should add that these are definitely not public domain.

There are three machine code utilities, two to aid Basic programming and one to aid machine code programming. First we have an item called *Stepping Stones*. This is a machine code monitor of sorts which allows you to step through code so that bugs can be identified. Traps based on register values can be set and you can identify subroutines which, since you know they are bug free, can be skipped or normalised. Whilst this is useful, it does lack features which would make it more valuable. I would have liked the option to disassemble code, read

tables of ASCII values and change portions via a simple assembler. There are a number of excellent products in this field offering stiff competition, and on its own, *Stepping Stones* doesn't quite make it.

The next item is called *Spritey*. This is an interrupt driven routine which makes control of sprites trivial. When your program is running, the routine scans five integer arrays and acts according to the values to position the sprites, colour them etc. The sprite designs are actually held within the code and a rudimentary sprite designer is provided. It does seem possible, however, to access other designs by directly changing the sprite pointers. I loved the method of controlling the sprites but disliked the sprite designer.

The adopted approach is to place the machine code starting at the normal start of Basic and to raise Basic above the code. This means that you can easily integrate the code in your program.

Finally, we have a snippet called *Italy Business Basic*. Those who wish to write business software such as databases will encounter the need to

input a lot of data in an idiot-proof manner. Where you have a formatted screen, the code (in Basic) to input data from the various fields need to be large. This item is a machine code routine which provides many such functions via simple commands. The commands include inputting from specific fields, setting up fields, getting idiot-proof inputs and file handling. The syntax of the commands are generally simple allowing you to write in-built programs easily. I found this item to be the best of the bunch and very handy.

Overall, I had one big complaint. The instructions were supplied via a large HELP program and commented domain. I prefer an instruction booklet. If you are in the middle of a large program, the last thing you want is to load a disk or other program and try to sort things out. At £18, this package is also a tough price.

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# Tech draw 64

*A comprehensive technical illustration aid for C64 owners for both disk and tape.*

As you should know, Your Commodore is always on the look out for high quality programs to publish in the magazine. However, some programs that we think are excellent may never appear in print due to their enormous length. With **Tech Draw 64** we are pleased to announce the birth of Your Commodore Software. This is an extension of our Software Service which will make high-quality programs available to our readers at a reasonable price. And **Tech Draw 64** is the very first program to be offered through this service.

**Tech draw 64** is a comprehensive technical illustration aid, utilizing the high-resolution mode of the C64. The program is either disk or cassette based and permits output to a selection of Commodore printers.

The program's ability to measure line lengths and angles allows geometric shapes to be drawn quickly and accurately. This together with precise copy and rotation features permits complex details to be constructed easily.

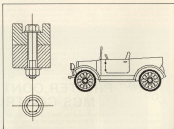
Once a drawing is completed it may be saved to disk or tape (depending on the version of the program) for future recovery and update.

For users requiring colour, there are a number of options existing. Photography of colourful drawings is therefore possible.

## In Use

The main menu of **Tech Draw 64** offers the following options:

- create drawing;
- return to drawing;
- save drawing;
- load drawing;



print drawing;  
help (for functions).

The **create drawing** option takes the user of the program to the drawing screen. The main cursor appears in the centre of the screen and is accompanied by two edge cursors which move along the horizontal and vertical axes.

These axes are graduated at intervals of eight pixels, so dividing the lines screen into a grid corresponding to the normal text screen. The axes and edge cursors can be used to position a drawing or to position drawings for colouring.

At the top of the screen is the prompt line; this is where you will be prompted for inputs, etc. by the program. The right hand edge of the prompt line contains a cursor bar. This

is used to give the user information on the length and angle of parts of the drawing in process.

## Moving around

A joystick is used to move the cursor around the screen. Two speeds of movement are provided. Fast mode allows you to move around the screen quickly, while slow mode allows you to position the cursor with accuracy.

## Plotting a point

All operations within the program are based around points. For example to draw a line, two points are plotted and the line command is used to join them together. Plotting a point requires only a single keypress; you will soon get the



being of defining points for each of the commands. Some commands, eg plotting an arc, require more than two points to be plotted on the screen.

Since the point plotted is quite small, just a single pixel, you may quite rightly think that positioning the cursor on a specific point is quite difficult. This is where the auto-cursor comes into play. This allows you to define up to nine different points on the screen and then jump the cursor around them by simply pressing the relevant key 1 to 9.

**Functions available**

**Line draw** - this requires two points to be plotted, the two ends of the line. Activating the line command gives you the option of drawing or erasing the line or, in case you make a mistake, abandoning the operation;

**Rays** - the Line command draws a line between two specified points. Rays is similar but draws several lines from the same original points;

**Box** - rectangles are a common feature in any technical drawing. Box allows

each shape to be drawn without having to reset to drawing such line individually. A box is drawn from two points which are to make up opposite the corners of the box; the command causes the box to be drawn with horizontal and vertical sides so as to join the two points;

**Circle** - two points are required in order to draw a circle. One point should be the centre of the circle and the other is any point on the circumference;

**Arc** - uses three points to produce an arc rather than a complete circle. Two versions of this command exist; either you specify the radius of the circle and the two ends of the arc; or you specify the ends of the arc and one point in between;

**Ellipse** - as you would expect, this draws an oval shape on the screen. Two points are required for the generation of an ellipse. One is the highest point on the ellipse the second the 3 O'clock position (the ellipse is always drawn with its axis horizontal or vertical);

**Freehand** - allows you to draw on the

screen freehand style. You can either draw or erase in freehand mode;

**Fill** - as its name suggests fills a closed figure with the current ink colour;

**Hatch** - in technical drawing a series of parallel diagonal lines are used to show a shaded area. The hatch option allows you to alter the width between the lines in a hatch operation;

**Text** - allows you to label and position any illustrations that you may produce.

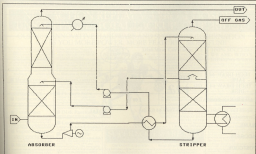
**Block functions**

A block function is one which allows you to carry out specific operations on a rectangular area of the screen. The block is designed, as for a rectangle, by plotting two points; you then select the operation you want.

The following operations are available:

**Wipe** - this is used to clear the defined block from the drawing;

**Copy** - this allows you to place a copy of the specified block elsewhere on the screen. Uses might include duplicating shapes, such as electronic symbols, at



This sample flowchart is a composite of four screen drawings. The screen axes and edge cursors are used to record the positions of the linking lines from one section to another.

different areas on the screen. You can place the originals for regularly used symbols around the sides of the screen leaving the centre free.

**Move** - this is similar to Copy, with the difference that this operation moves the specified area to a new point on the screen, deleting the old area.

**Rotate** - this function permits a block to be rotated through any angle about a defined centre of rotation.

**Colouring it in**

Even though Tech Draw 64 is mainly designed with technical drawing in mind, some users will want to use colour in their designs.

Tech Draw 64 allows you to specify the colour of the ink that you are using and the background colour. Local colour allows you to alter the background colour under the cursor to the one specified. Only two colours, foreground and background, per character square are allowed because of the limitations of the C64's hardware in hi-resolution mode.

The ink colour of any rectangular block on the screen can be changed

with the no-ink block function.

**Once you're done**

As previously mentioned, provision exists to SAVE your finished masterpiece onto either tape or disk, depending on the version of the program that you are using. The printer option allows you to reproduce your drawing on either a Commodore 1526 printer, or an MPS 801/802, or compatible.

In the case of 801/802 you will have the choice of either large or small print-out.

The 1526 printer option produces small but accurate copies of your drawing. It is rather slow, since it has to re-define the character to be printed as the drawing is reproduced.

**What to do**

Tech Draw 64 is an extremely powerful drawing package, especially suited to users who need to produce accurate drawings and technical illustrations. The program is available only from Your Commodore and comes complete

with a manual explaining each command in much more detail than we can go into here.

The cost of the program is £8.95 for both disk and tape versions, and this price includes package and postage. Orders for the program should be on the form at the foot of this article, and should be accompanied by a cheque or postal order for £8.95 made payable to Argus Specialist Publications. Overseas readers should add a further £1.00 Sterling to cover the extra postage.

Orders should be sent to the Readers Services address on the form NOT to the Your Commodore editorial address.

**More to come**

As mentioned before Tech Draw 64 is the first of a series of high-quality programs that we will be making available to the public, but which are too large and would require too much documentation to publish in its magazine as a listing. Watch this space for future offers!

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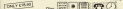


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# Programmable Function Keys

*Have you ever wished that you could make more use of the function keys on your C64? This utility could be what you've been waiting for.*

*By D.J. Baker*

The function keys on the C64 are extremely useful for selecting options within a program and are easy to detect. However, on many computers it is possible to store strings of characters in memory so that when the key is pressed a specified operation is carried out. Even though the C64 has function keys, for some silly reason Commodore didn't provide a simple way for you to use them in this fashion.

This program will allow you to store up to 30 characters, commands etc. in memory so that C64 owners can now have access to five programmable keys. In use function keys are an invaluable and time saving tool. You could for example define a key so that a press of it will LIST your program, or even LOAD a program off of disk or tape. In fact the possibilities are endless.

## Getting It In

The program is presented in the form of a Basic loader and should present you with no difficulties when entering. Do make sure that you have read the LISTING's page and are using the Syntax Checker to aid your typing. When the program has been entered make sure that you SAVE it before you RUN it. Once the program has been RUN type NEW and then SYS 32224 to start the Function Key program.

## In Use

The keys F1 to F5 can all be defined as function keys. You can store a string of up to 30 characters in each key. When you press the key the characters will be reproduced as if you had them on the keyboard.

### PROGRAM: FLNKY LOAD

```

01 100 REM *****
02 110 REM *
03 120 REM * MACRO KEY UTILITY *
04 130 REM *
05 140 REM *****
06 150 :
07 160 :
08 170 COUNT = 0:PRINT CHR$(171);"DISCIPLINE
    WAIT-ENTERING DATA..."
09 180 REM 8 SPACES
10 190 FOR X = 00000 TO 9999:REM A : FOR X
    A : COUNT = COUNT + 1
11 200 PRINT CHR$(170);X : NEXT X
12 210 PRINT
13 220 IF COUNT < 99999 THEN PRINT "DATA ERROR
    : COUNT =";COUNT : STOP
14 230 PRINT "DATA CORRECT - SAVE, THEN SYS 32224
    % 00", "OR DISK ROUTINE 1600 100."
15 240 STOP
16 250 :
17 260 DATA 70, 30,000, 00, 00, 00, 00, 00, 30
    , 70, 00, 00, 30, 00
18 270 DATA 70, 30, 00, 00, 00, 00, 00, 00, 00
    , 00, 00, 70, 70, 70
19 280 DATA 00, 00, 1, 1,100,100, 50,100, 20
    , 3,100,000,100, 01
20 290 DATA 0, 000, 0, 0,000,000, 0,000,000,100
    , 0,000,000, 00, 00
21 300 DATA 30,100,000,100,100,000, 00,000,100
    ,100, 2,000,100,100
22 310 DATA 17,000,100,100,100, 10,100,100,000,100
    ,000, 30,000,100,000
23 320 DATA 0, 70,000,000, 70, 00,000,100, 0
    , 30, 00,000,100, 10
24 330 DATA 30, 00,000, 30,100,000, 30,100,000,100, 0
    ,100, 0,000,100, 10
25 340 DATA 30,000,100, 10, 30,000,100, 10, 30
    ,000,100, 0,100, 30
26 350 DATA 000,000,100,000,100,100,100,100,100,100
    ,000,100, 0,100, 30
27 360 DATA 000,100, 100,000, 1,100, 70, 30,100,000,100
    ,100,100,100,000, 00
28 370 DATA 000, 000,000,100,000,100,000,10,100, 0,100
    , 3, 70,100,000,100
29 380 DATA 100,100, 00, 70,000,000,100, 0,000
    ,000, 30,100, 0,000

```

F7 is used to call the key define routine and F8 is used to clear a definition. When you press F7 or F8 you will be prompted for the key that you wish to define or clear. When the relevant key is entered an asterisk (\*) is displayed to show that the press has been registered. You should now type in the text that you wish to be located in the key. Use the left arrow key to make definition and the combination of left and space to delete characters.

Any key presses that would produce a normal graphic in a print statement, CLR, HOME etc. will have their symbol displayed as a left arrow in the definition. Keys may be re-defined at any time by repeating the definition procedure. Any keys that have not been defined or have been cleared will be ignored whenever they are pressed.

For those interested, the program starts at memory location \$C000 (\$2124) and that for the 80100 expands both your definitions. The IRQ vector at \$0314/3 is altered to point to this routine. 75

04	000	0404	100,176	0,001,100,174	0,100,100	00
					30,010,000,000,100	
04	010	0404	30,000,000,100	100,100	00	30,010,000,100
					70,100,000,100,100	
17	000	0414	0,000,100	10,30,010,000	70,00	
					000,00,000,100,100	
00	000	0404	100,0	0,100,0	0,010,0	7,100,00,100
					31,70,000,000,100	
21	000	0404	7,000,100	70,000,100	07,000,100	07,000,100
					0,100,0	0,000,100
00	000	0414	10,100,000	70,100,0	0,100,0	00,000
					001,10,100,10,70	
07	000	0414	100,0	0,100,0	0,000,0	00,010,000,000
					000,10,000,000,100	
00	000	0414	00,000,00	00,100,10,100	10,100,10,100,000,100	100
					07,000,00,000,10	
04	000	0414	07,000,100	00,000,100	00,000,100	00,000
					10,70,10,000,100	
12	000	0414	000,100,000,100	01,100,0	01,000,000,000	01,000
					100,0,100,0	
70	000	0414	007,100,0	0,000,000,000	01,000,000	
					000,70,00,000,100	
00	000	0414	0,000,001	00,000,001	00,000,001	00,000,000
					000,70,00,000,00	
70	000	0414	00,100,000,001	000,100,000,001	000,100,000,001	100
					100,000,001,100,000	
00	000	0414	001,00,000,100,100	00,000,100,100,100	00,00,00,000	00
					000,100,0,000,0	
00	000	0404	000,0	00,100,00,000	70,100,000	
					00,100,100,0,70	
00	000	0404	100,00,100,100	0,00,100,100	0,00,100,000	00
					000,000,001,0,000	
04	000	0404	001,100,100,100,100	0,100,100	0,100,100	00

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# CALC 64

*For those annoying little sums that you can't do in your head, CALC 64 will speedily come to your aid.*

*By T. Lonsbury*

Unless you own one of those nifty computer calculators, it can be annoying and troublesome to break off writing a program to check the result of a calculation. If you are using Basic, then a direct mode statement can often give you the answer. When the calculation is lengthy, then a short stand-alone routine can sometimes suffice.

If you are writing machine code, then additions, subtractions and logical operations should have been confirmed before the code is entered at the keyboard. The use of a monitor such as the excellent Z80M is to be recommended. Logical operations can be checked by a short routine, written in a spare part of memory, ending in a BRK instruction.

But you cannot beat the convenience of a fast calculator for such work.

## The Program

CALC will give you this facility, at the touch of a key. It is a handy, instant result calculator that performs operations on real (floating point) numbers and will also handle complex arithmetic. Additions, subtractions, shifts, rotates, logical operations, can all be done by pressing the relevant command key.

When installed, the F1 key calls up CALC, where the last result can be seen and rotated, or printed on the screen for use in your program.

CALC has two menus. Each menu is a four-line "check-sheet" menu at

the top of the screen. The information that originally occupied those four lines is saved to memory and retained upon exit. The top two lines of each menu contain the commands and the third line displays the calculator total so far. Line four is the guidance line and is a fuller description of the current command.

## In Use

When CALC is first entered, the first menu is displayed with the command ZERO highlighted. Use of the cursor keys will take the highlighting to further commands. The cursor keys can be used in either direction, and there is full wrap-round to both ends of each menu. Pressing RETURN then executes the selected command.

When the commands are familiar, there is a quicker way to use CALC - just press the initial letter of the required command, and that command will be executed immediately without having to press RETURN.

## Commands

When CALC is first entered the following commands are available:

**ZERO:** Sets the floating point total to zero.

**PLACES:** Sets the number of decimal places displayed (range: 1-8).

**ADD:** Add number to total.

**SUBR:** Subtract number from total.

**MULTIPLY:** Multiply total by number.

**DIVIDE:** Divide total by number.

**RESULT:** Prints result to the screen and exits CALC. The result is printed at the cursor position when CALC was entered, and the cursor is repositioned on the line below the result.

**INTEGER:** As with Basic's INT function - removes the fractional part of the total.

**FRACTION:** The opposite of INT - removes the figures before the decimal point, leaving the decimal fraction only.

**STANDBY:** Access to second menu.

**QUIT:** Quits CALC and returns to Basic. The F3 key can also be used to quit CALC. This enables the user to watch a quick look at the results so far, and then exit by pressing the next nearest function key.

Entry to the second menu presents the following commands:

**ZERO:** Zero accumulator.

**NUM:** Enter number into accumulator.

**PLUS:** Add with Carry.

**MINUS:** Subtract with Carry.

**INCR:** Increment accumulator.

**DECR:** Decrement accumulator.

**TOTAL:** Print conversion line on screen and exit CALC.

**CC:** Clear the Carry flag.

**CF:** Set the Carry flag.

**AND:** Perform logical AND.

**OR:** Perform inclusive OR.

**EXOR:** Perform Exclusive OR.

**SHIFT:** Shift left or right.

**ROTATE:** Rotate left or right.

**PRINT:** Exit to first menu.

## Entering the Program

CALC sits on the 50000-BYF4F (50150-5024F) block of memory. Type in the program exactly as shown, row and line count. The program will guide the data statements into memory, checking for typing errors and illegal quantities as it goes. The line number will be displayed in the event of an error. If the key gets stuck or a disk is by the door, press RETURN. CALC will then be written to disk and can be loaded on future use by COMMAND.COM 5.1. When CALC has finished, type NEM RETURN, followed by SYS49132. CALC is then ready for use.

If you do not have a disk drive, change line 1170 to read: SAVE=CALC,1:1

## PROGRAM: CALC LOADER

```

59 49100 DATA0,1,149,192,141,1
    1,1,149,1,141,1,200,88,149,
    1,141,149
60 49110 DATA0 200,149,257,149
    1,149,1,200,200,200,1,
    1,1,1,200,149,149
61 49120 DATA0,200,149,200,200,2
    20,12,173,141,2,181,1,248,9,
    173,21,2833
62 49130 DATA207,140,1,108,11,1
    20,14,10,248,218,141,183,187
    144,100,200,1180
63 49141 DATA110,108,218,183,187
    200,108,207,142,139,141,183
    200,149,0,141,2103
64 49150 DATA 207,149,200,141,
    13,211,149,204,141,180,187,1
    43,111,141,1,141,2143
65 49160 DATA207,149,173,153,204,
    173,181,173,14,208,141,248,20
    1,171,1,108,1818
66 49180 DATA141,98,107,149,133
    141,12,208,149,100,144,91,2
    44,173,14,2,2104
67 49190 DATA243,200,200,149,1,
    243,139,1,14,181,184,171,24,
    149,1,200,2000
68 49210 DATA200,149,21,141,24,
    208,149,1,144,182,200,180,17
    1,6,1,248,1798
69 49230 DATA207,200,173,1,2,16
    1,288,200,148,144,91,5,16
    9,208,141,2000
70 49250 DATA 1,148,147,141,14
    1,7,148,1,9,1,81,145,32,74,
    173,174
71 49260 DATA149,1,141,180,187,
    12,208,180,12,188,184,10,111
    183,171,180,3084
72 49274 DATA2107,141,1,108,9,12
    47,153,10,22,181,18,244,132
    2,1,149,141,173
73 49280 DATA173,10,24,230,249,
    0,132,211,149,4,131,242,173,
    4,287,170,2118
74 49300 DATA149,134,207,133,25
    1,148,1,17,1,251,201,12,140,9
    1,17,189,140,2100
75 49320 DATA130,200,170,10,108
    200,10,200,187,1,108,130,0,0
    20,214,10,214,2184
76 49340 DATA200,200,134,208,5,
    76,11,74,200,25,140,48,281,
    157,244,200,2388
77 49360 DATA171,140,207,308
    1,208,18,182,0,184,121,13,19
    7,148,11,1818
78 49374 DATA110,224,18,208,24,9
    14,75,173,182,11,184,221,3,
    207,248,12,2380
79 49384 DATA110,234,16,208,144
    2,200,13,244,173,174,
    71,191,142,2,207
80 49400 DATA141,141,107,207,144,7
    4,287,173,10,108,188,238,3,7
    67,173,182,2108
81 49420 DATA207,207,1,208,18,1
    73,4,200,204,11,208,8,148,8,
    141,4,1761
82 49440 DATA207,78,144,150,78,
    252,170,177,4,207,281,28,208
    78,144,11,77,148,149,188,148
83 49460 DATA1,1,1,187,78,244,1
    91,10,108,149,188,4,187,171,
    182,207,201,2378
84 49480 DATA1,184,12,173,4,200
    207,8,141,178,244,142,144,1,
    0,141,1844
85 49500 DATA181,149,0,131,25
    1,73,8,200,170,133,4,187,181,1
    0,140,0,1210

```

```

17 49600 DATA0,144,1,13,149,21,
    141,1,207,249,8,251,254,16,2
    21,182,18,2125
18 49610 DATA207,1,148,0,31,248
    239,149,131,10,173,248,171,
    1,200,200,244,10,218,248,171,
    1,100,200,200,200,182,
    0,148,0,149,2148
19 49630 DATA148,148,208,10,30,
    171,14,171,4,107,14,149,149,
    51,248,141,2494
20 49644 DATA183,200,210,189,51
    1,231,241,244,184,188,181,207
    1,1,188,178,2248
21 49660 DATA1,134,142,1,12,48
    280,242,0,149,144,200,144,2
    10,230,204,2044
22 49680 DATA,208,244,173,180,
    149,141,134,2,173,199,200,144
    1,1,188,178,2248
23 49710 DATA107,149,18,188,
    171,181,207,141,14,208,149,5
    4,173,1,180,2328
24 49730 DATA187,0,180,191,0,
    5,183,0,141,191,0,184,180,18
    2,248,1748
25 49754 DATA108,179,173,180,15
    1,144,178,1,141,0,188,189,14
    4,144,209,11,2388
26 49774 DATA119,16,208,248,149
    20,231,3,170,171,187,207,14
    2,1,3,173,2004
27 49794 DATA188,207,149,1,3,14
    8,71,141,24,1,88,149,0,141,15
    1,1,1,188
28 49814 DATA108,206,207,173,20
    0,287,144,134,2,31,211,210,1
    71,4,207,201,2374
29 49834 DATA 748,10,281,17,24
    8,8,149,0,133,188,133,207,94
    1,141,1,1491
30 49854 DATA141,41,191,149,141
    208,208,149,1,173,12,148,175
    1,140,171,181,2048
31 49884 DATA0,140,1,210,20,24
    8,9,76,170,184,149,1,141,148
    2,207,8,2001
32 49914 DATA149,2,144,144,200,
    96,142,8,148,0,157,0,1,212,2
    2,247,17,1,1,1,1,1,1,1,1,1
33 49934 DATA108,248,78,149,0,6
    31,230,249,4,173,132,149,0,3
    1,200,149,2104
34 49954 DATA14,133,234,149,24,
    1,171,1,149,0,173,149,149,140
    1,170,1,149,149
35 49974 DATA149,133,46,249,242,1
    31,141,182,0,141,4,287,140,0,
    185,0,1341
36 49990 DATA 173,0,180,183,0,
    214,173,0,181,180,187,180,20
    8,178,181,2014
37 50014 DATA0,181,200,157,208,
    15,173,132,10,208,248,173,1
    15,141,187,200,212
38 50034 DATA149,149,5,173,1,4
    8,34,142,0,149,0,3,244,210,
    44,24,1494
39 50054 DATA200,2,248,0,31,248
    225,189,18,12,100,151,44,10
    235,173,2210
40 50084 DATA1,248,3,76,81,16
    2,100,187,173,149,140,181,12
    1,187,149,2284
41 50104 DATA207,210,234,2,208
    248,142,0,149,0,149,210,210,
    235,2,208,2322
42 50124 DATA147,173,184,181,10
    3,233,173,155,201,133,14,46
    1,173,149,2214

```

## C64 PROGRAM

```

43 30000 DATA 1,200,8,180,141,24
    9,300,12,76,171,98,185,205,1
    85,200,32,20000
47 30040 DATA 1,1,86,149,139,
    140,1,81,2,70,171,76,27,17,1
    7,1,18,141
48 30080 DATA 10,10,30,10,10,30,
    10,1,10,30,10,10,10,10,1,3
    1,201
49 30120 DATA 10,10,10,10,10,10,
    10,10,148,8,188,194,180,180,
    10,10,10,10,10
50 30160 DATA 1,76,17,144,3,1,1
    87,76,85,88,89,90,76,83,7,4
    4,44,134
51 30200 DATA 30,30,30,100,10,10
    1,100,30,30,1,1,1,10,144,144,
    78,308,792,2188
52 30240 DATA 112,348,200,30
    160,200,76,149,130,204,200,70
    10,160,160,76,21000
53 30280 DATA 1,0,144,8,100,10
    1,200,15,15,1,10,218,175,188
    704,70
54 30320 DATA 10,1,1,15,108
    1,17,141,200,204,8,200,8,144
    1,14,2,1571
55 30360 DATA 100,100,8,240,270
    141,107,107,118,70,200,70,4
    88,181,10,201,1000
56 30400 DATA 1,1,149,112,160,30
    1,171,10,207,118
57 30440 DATA 1,1,112,160,200
    7,11,160,160,169,112,160,200
    7,10,160,168,76,2188
58 30480 DATA 1,150,10,211,107
    175,110,200,7,76,208,19
    2,10,107,171,214
59 30520 DATA 1,1,110,107,10
    40,180,1,100,218,1,10,107,10
    7,171,10,207,118
60 30560 DATA 1,0,76,208,200,3
    1,218,100,168,112,160,107,10
    10,10,76,1144
61 30600 DATA 1,1,150,30,210,160
    171,112,200,108,1,76,208,19
    1,10,10,10,10,218
62 30640 DATA 1,1,10,200,30,30
    15,107,76,70,112,10,200,100
    0,160,168,10,2188
63 30680 DATA 1,1,10,10,210,21
    142,0,188,36,207,190,7,50,21
    0,240,212,2207
64 30720 DATA 1,10,186,173,181
    200,200,181,218,218,218,218
    10,142,186,2188
65 30760 DATA 1,10,180,200,180,
    141,182,200,30,200,208,180,0
    173,200,180,2181
66 30800 DATA 1,10,69,138,10,10,2
    3,10,7,10,188,76,181,180
67 30840 DATA 1,187,157,10,10,3
    7,10,204,8,208,210,30,218,1
    91,10,204,188,2008
68 30880 DATA 1,132,160,207,30
    48,164,162,8,148,8,107,131,
    207,137,112,2080
69 30920 DATA 1,110,218,8,208,
    248,76,211,180,218,181,207,1
    89,11,161,8,2105
70 30960 DATA 1,10,186,187,76,
    17,186,188,0,76,118,187,11,1
    76,188,178,2080
71 31000 DATA 1,300,76,196,187
    1,30,190,34,171,164,287,1
    88,173,164,200,108
72 31040 DATA 1,200,76,116
    187,30,130,198,14,173,144,1
    07,104,170,182,1980
47 31080 DATA 1,210,241,200,76
    118,197,218,181,207,116,208,
    80,188,182,200,2000
58 31120 DATA 208,180,30,200,
    180,10,18,184,180,8,189,184,1
    07,31,110,2010
59 31160 DATA 1,131,204,18,788
    143,76,157,188,189,8,184,184
    1,107,184,8,2420
60 31200 DATA 1,158,173,141,28
    7,13,201,200,76,106,181,10,1,
    76,198,171,162,2287
25 31240 DATA 1,17,240,200,160
    162,187,76,208,170,30,188,3
    84,173,188,207,218
41 31280 DATA 1,1,10,16,173,3
    41,107,10,161,182,207,76,208
    147,178,181,2282
5A 31320 DATA 1,161,162,200
    76,208,100,3,188,184,178,1,
    88,207,181,1,2188
48 31360 DATA 1,1,18,173,144,1
    200,208,10,16,173,144,1
    200,208,10,16,200,40,141,1
    40,200,76,189,2128
49 31400 DATA 1,26,173,164,187
    1,208,173,142,200,106,161,187
    200,168,0,41,2180
48 31440 DATA 1,144,107,76,208
    1700,160,8,118,8,207,168,1,
    80,180,200,1818
64 31480 DATA 1,6,208,192,160,1
    28,157,112,200,210,218,3,208
    2,248,240,8,2101
58 31520 DATA 1,197,76,200,27
    324,34,208,198,141,167,207,
    160,70,8,218723
80 31560 DATA 1,10,288,200,100
    8,160,110,207,160,110,200,0
    87,164,10,218,2188
72 31600 DATA 1,164,180,70,210
    188,10,218,210,240,211,181,
    20,188,18,31,2188
69 31640 DATA 1,218,208,111,20
    1,177,11,100,48,183,190,183
    76,183,107,200,2181
45 31680 DATA 1,108,18,188,27,3
    111,207,160,178,160,76,80,80
    8,218,48,208,2173
68 31720 DATA 1,14,170,287,160
    3,76,4,188,161,1,161,160,160
    18,1,1,188,18
63 31760 DATA 1,101,10,144,180
    200,26,176,199,173,111,207,
    173,76,200,10,2181
69 31800 DATA 1,10,111,30,111,30
    7,173,111,287,188,118,208,168
    0,794,100,248,2821
51 31840 DATA 1,160,160,160,2
    11,180,8,180,160,160,160,160
    16,181,181,1818
67 31880 DATA 1,10,200,188,168
    34,178,123,189,187,173,173,3
    2,178,173,162,2128
54 31920 DATA 1,268,200,31,218
    187,76,162,8,178,178,30,218
    1,178,178,268,268,168,168,0,181
    168,207,162,3,10,40,180,31,1
    88,182,160,2148
14 31960 DATA 1,110,200,168,
    184,10,270,178,168,170,20,21
    0,270,170,218,2187
80 32000 DATA 1,300,300,200,200,
    200,300,300,300,200,181,2
    308,180,180,180,200,181,2
    40,173,181,200,2181
62 32040 DATA 1,187,248,180,76,
    187,30,130,198,14,173,144,1
    07,104,170,182,1980
62 32080 DATA 1,187,248,180,76,
    187,30,130,198,14,173,144,1
    07,104,170,182,1980

```





00	32790 DATA01,78,67,62,65,62	5	6,610	5	78,84,32,78,83,84,32,78,78
01	32800 DATA02,70,69,74,73,61,84	6A	5076A DATA78,70,201,78,67,78	20	5075A DATA60,60,78,71,69,6,1
02	32810 DATA03,70,66,67,10,79	7	80,83,73,68,69,50,200,218,9	1	6,32,32,30,30,30,32,30,30,30
03	32820 DATA04,70,66,67,10,79	8	2,32,6438	2	6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6
04	32830 DATA05,67,62,65,63,63	9C	0,18,32,204,79,71,71,67,63,7	3	6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6
05	32840 DATA06,67,62,65,63,63	6	6,610	4	6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6
06	32850 DATA07,66,66,32,78,78	6B	5281A DATA32,197,88,67,76,69	11	5180A DATA08,78,66,77,73,66,
07	32860 DATA08,66,66,32,78,78	7	80,78,88,69,32,200,32,9	6	64,44,45,63,78,69,69,63,78,9
08	32870 DATA09,78,66,32,69,69	8	2,32,1608	7	7097
09	32880 DATA10,78,66,32,69,69	9C	52820 DATA32,70,32,70,32,8,0	9C	2,602A DATA0,0,0,0,0,0,0,0,0,0,
10	32890 DATA11,78,66,32,69,69	6	6,32,813,73,71,50,66,32,78,6	7	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
11	32900 DATA12,82,70,66,71,64	9C	2,610	7	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
12	32910 DATA13,78,66,32,69,69	9C	2,610	8	0,10,78,32,32,32,32,32,32
13	32920 DATA14,78,66,32,69,69	9C	73,66,32,32,32,32,32,32,32,32,9	9	2,610
14	32930 DATA15,82,70,66,71,64	9C	2,610	9C	2,610
15	32940 DATA16,78,66,32,69,69	9C	2,610	9C	2,610
16	32950 DATA17,78,66,32,69,69	9C	2,610	9C	2,610
17	32960 DATA18,82,70,66,71,64	9C	2,610	9C	2,610
18	32970 DATA19,78,66,32,69,69	9C	2,610	9C	2,610
19	32980 DATA20,78,66,32,69,69	9C	2,610	9C	2,610
20	32990 DATA21,78,66,32,69,69	9C	2,610	9C	2,610
21	33000 DATA22,82,70,66,71,64	9C	2,610	9C	2,610
22	33010 DATA23,78,66,32,69,69	9C	2,610	9C	2,610
23	33020 DATA24,78,66,32,69,69	9C	2,610	9C	2,610
24	33030 DATA25,82,70,66,71,64	9C	2,610	9C	2,610
25	33040 DATA26,78,66,32,69,69	9C	2,610	9C	2,610
26	33050 DATA27,78,66,32,69,69	9C	2,610	9C	2,610
27	33060 DATA28,82,70,66,71,64	9C	2,610	9C	2,610
28	33070 DATA29,78,66,32,69,69	9C	2,610	9C	2,610
29	33080 DATA30,78,66,32,69,69	9C	2,610	9C	2,610
30	33090 DATA31,82,70,66,71,64	9C	2,610	9C	2,610
31	33100 DATA32,78,66,32,69,69	9C	2,610	9C	2,610
32	33110 DATA33,78,66,32,69,69	9C	2,610	9C	2,610
33	33120 DATA34,82,70,66,71,64	9C	2,610	9C	2,610
34	33130 DATA35,78,66,32,69,69	9C	2,610	9C	2,610
35	33140 DATA36,78,66,32,69,69	9C	2,610	9C	2,610
36	33150 DATA37,82,70,66,71,64	9C	2,610	9C	2,610
37	33160 DATA38,78,66,32,69,69	9C	2,610	9C	2,610
38	33170 DATA39,78,66,32,69,69	9C	2,610	9C	2,610
39	33180 DATA40,82,70,66,71,64	9C	2,610	9C	2,610
40	33190 DATA41,78,66,32,69,69	9C	2,610	9C	2,610
41	33200 DATA42,78,66,32,69,69	9C	2,610	9C	2,610
42	33210 DATA43,82,70,66,71,64	9C	2,610	9C	2,610
43	33220 DATA44,78,66,32,69,69	9C	2,610	9C	2,610
44	33230 DATA45,78,66,32,69,69	9C	2,610	9C	2,610
45	33240 DATA46,82,70,66,71,64	9C	2,610	9C	2,610
46	33250 DATA47,78,66,32,69,69	9C	2,610	9C	2,610
47	33260 DATA48,78,66,32,69,69	9C	2,610	9C	2,610
48	33270 DATA49,82,70,66,71,64	9C	2,610	9C	2,610
49	33280 DATA50,78,66,32,69,69	9C	2,610	9C	2,610
50	33290 DATA51,78,66,32,69,69	9C	2,610	9C	2,610
51	33300 DATA52,82,70,66,71,64	9C	2,610	9C	2,610
52	33310 DATA53,78,66,32,69,69	9C	2,610	9C	2,610
53	33320 DATA54,78,66,32,69,69	9C	2,610	9C	2,610
54	33330 DATA55,82,70,66,71,64	9C	2,610	9C	2,610
55	33340 DATA56,78,66,32,69,69	9C	2,610	9C	2,610
56	33350 DATA57,78,66,32,69,69	9C	2,610	9C	2,610
57	33360 DATA58,82,70,66,71,64	9C	2,610	9C	2,610
58	33370 DATA59,78,66,32,69,69	9C	2,610	9C	2,610
59	33380 DATA60,78,66,32,69,69	9C	2,610	9C	2,610
60	33390 DATA61,82,70,66,71,64	9C	2,610	9C	2,610
61	33400 DATA62,78,66,32,69,69	9C	2,610	9C	2,610
62	33410 DATA63,78,66,32,69,69	9C	2,610	9C	2,610
63	33420 DATA64,82,70,66,71,64	9C	2,610	9C	2,610
64	33430 DATA65,78,66,32,69,69	9C	2,610	9C	2,610
65	33440 DATA66,78,66,32,69,69	9C	2,610	9C	2,610
66	33450 DATA67,82,70,66,71,64	9C	2,610	9C	2,610
67	33460 DATA68,78,66,32,69,69	9C	2,610	9C	2,610
68	33470 DATA69,78,66,32,69,69	9C	2,610	9C	2,610
69	33480 DATA70,82,70,66,71,64	9C	2,610	9C	2,610
70	33490 DATA71,78,66,32,69,69	9C	2,610	9C	2,610
71	33500 DATA72,78,66,32,69,69	9C	2,610	9C	2,610
72	33510 DATA73,82,70,66,71,64	9C	2,610	9C	2,610
73	33520 DATA74,78,66,32,69,69	9C	2,610	9C	2,610
74	33530 DATA75,78,66,32,69,69	9C	2,610	9C	2,610
75	33540 DATA76,82,70,66,71,64	9C	2,610	9C	2,610
76	33550 DATA77,78,66,32,69,69	9C	2,610	9C	2,610
77	33560 DATA78,78,66,32,69,69	9C	2,610	9C	2,610
78	33570 DATA79,82,70,66,71,64	9C	2,610	9C	2,610
79	33580 DATA80,78,66,32,69,69	9C	2,610	9C	2,610
80	33590 DATA81,78,66,32,69,69	9C	2,610	9C	2,610
81	33600 DATA82,82,70,66,71,64	9C	2,610	9C	2,610
82	33610 DATA83,78,66,32,69,69	9C	2,610	9C	2,610
83	33620 DATA84,78,66,32,69,69	9C	2,610	9C	2,610
84	33630 DATA85,82,70,66,71,64	9C	2,610	9C	2,610
85	33640 DATA86,78,66,32,69,69	9C	2,610	9C	2,610
86	33650 DATA87,78,66,32,69,69	9C	2,610	9C	2,610
87	33660 DATA88,82,70,66,71,64	9C	2,610	9C	2,610
88	33670 DATA89,78,66,32,69,69	9C	2,610	9C	2,610
89	33680 DATA90,78,66,32,69,69	9C	2,610	9C	2,610
90	33690 DATA91,82,70,66,71,64	9C	2,610	9C	2,610
91	33700 DATA92,78,66,32,69,69	9C	2,610	9C	2,610
92	33710 DATA93,78,66,32,69,69	9C	2,610	9C	2,610
93	33720 DATA94,82,70,66,71,64	9C	2,610	9C	2,610
94	33730 DATA95,78,66,32,69,69	9C	2,610	9C	2,610
95	33740 DATA96,78,66,32,69,69	9C	2,610	9C	2,610
96	33750 DATA97,82,70,66,71,64	9C	2,610	9C	2,610
97	33760 DATA98,78,66,32,69,69	9C	2,610	9C	2,610
98	33770 DATA99,78,66,32,69,69	9C	2,610	9C	2,610
99	33780 DATA100,82,70,66,71,64	9C	2,610	9C	2,610



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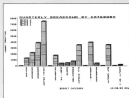
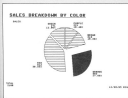
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# Two from Adamsoft

*Adamsoft has imported some impressive Abacus software from the U.S. in the past. Read on to see if the two latest offerings match up to the standards already set.*

*By Paul Eves*



**M**ost of the Abacus software that we've seen in the office in recent months has made a very good impression on us. Recently we've been set two new packages.

The first is a C64/128 version of **COBOL**, probably one of the most useful programming languages around. The second is a handy chart package which will enable you to see a graphic display of statistics or other useful information.

## COBOL 128/COBOL 64

For those of you who like to have an easy life as far as programming is concerned, this package from Abacus Software is a treat.

COBOL is the most widespread commercial programming language in

use today. The reasons for its success are many.

So what is COBOL? The word COBOL is the abbreviated form of Common Business Oriented Language. It is business oriented for use in commercial programs. COBOL is a language that is common to many computers. Therefore, most computers equipped with a COBOL system can process any COBOL program, with only minor modifications.

The one single fact that makes this a great language to use, as far as I am concerned, is its English-like format. There is no complicated coding to be done. For example, to add two items together you simply say **ADD**. Another example is **MULTIPLY** hours-worked **BY** hourly-wage

**GIVING** gross-wage.

Obviously, the major advantage of such a language lies with the commercial sector more than the home micro-market. However, anybody who likes to do accounting programs or business software will surely find it advantageous.

## Ingredients

Basically, COBOL programs are split into four distinct sections, these are:

**IDENTIFICATION** division  
**ENVIRONMENT** division  
**DATA** division  
**PROCEDURE** division

The **IDENTIFICATION** division identifies the program. In addition to

required information, the programmer may include such optional items as the date of the program, and the name of the programmer. This division is completely machine dependent.

The ENVIRONMENT division specifies the equipment being used, and some information about the files that will be used.

The DATA division contains file and record descriptions being manipulated or created and the individual logical records which comprise those files.

The PROCEDURE division is what we can call the 'Program'. This section contains the ENGLISH-LIKE statements that go into making up the program files.

### Structure

Once you have mastered this breaking down of the overall program into these four sections, you are half way there. Very briefly, I will demonstrate the structure of the above divisions. This structure must be adhered to in every COBOL program.

In Example 1 the following example, all entries in capitals are mandatory. Entries in square brackets are optional.

```

Example 1 IDENTIFICATION DIVISION.
PROGRAM-ID. PROG NAME
[author. Joe Bloggs]
[date-written. 22 April 87]
ENVIRONMENT DIVISION.
CONFIGURATION SECTION.
SOURCE-COMPUTER. C64.
OBJECT-COMPUTER. C64.
[input-output section]
[file-control]
    [select data 1 assign to disk-1541 drive 8]
DATA-DIVISION.
[file-selection]
[01 data-record]
    [02 name-field pic x (15)]
    [02 address-field pic x (15)]
    [03 tele-no pic x (10)]
[working-storage section]
[77 return-code value chr13 pic x]
PROCEDURE-DIVISION.
START.
(these are the actual program instructions)
END
  
```

There isn't enough room here to go into the ins and outs as to how each section is made up. Suffice to say, that once you have mastered this format, then you will have no trouble developing your COBOL programming skill.

Like all high level languages, COBOL is a structured language. At this point, I must admit that in general I do not like structure programming. Half the fun of programming to me is doing it as I go, however the accepted norm is that structuring is good for you.

I must also admit that I did have a little knowledge of COBOL before I tried this package from Adams, consequently I was able to understand the manual with some ease. First time users would probably need to read the included manual two or even three times before it all sank in.

In general the manual is well laid out and informative. The software comprises of an Editor, Compiler, Interpreter and De-bugger.

The De-bugger is a very powerful tool which allows you to produce bug-free programs everytime. The De-bugging takes place on the source file, so there is no heavy machine language knowledge required on the part of the

user. The Editor and De-bugger sections are all menu driven, and are thus easy to use.

I think that this is so far the best COBOL program for the C128/C64 that I have come across.

### Chartpak

The second of the Adams Software products, distributed by Adamssoft, is Chartpak 64/128. This is a very powerful package that enables you to create professional charts and graphs, without the headache of programming.

If you need to draw a quick pie, bar, line or scatter graph/chart from your own data, you can do so interactively. Chartpak instantly draws it on the screen for you. You can even take your data from Multiplan or Colortext.

Chartpak also supports statistical analysis features, data reduction, exponential smoothing, least squares and a host of other things.

On the C128, the resolution is three times greater than on the C64. The package also supports a large range of different printer types.

Once again, the manual is both comprehensive and fairly straightforward to follow. It takes you gently from the initial operation stage, hardware requirements and definitions used on to the actual tutorial.

The manual contains a few example charts/graphs for you to experiment with.

The last chapter is devoted to the more advanced Data-reduction tutorial.

To be honest, I preferred the C64 version to the C128 version, mainly because I think the screen layout is better.

There are a total of nine types of chart available. Pie chart, Horizontal Bars, Horizontal 3D Bars, Horizontal Graph, Vertical Bars, Vertical 3D Bars, Vertical Graph, X-Y Plot and Comparison Plot. Everything is Menu driven with built in safeguards should you make a mistake in your selection.

I must admit that I was pretty well impressed with some of the results that I managed to achieve after only a few hours 'fiddling about'.

### Touchline

Adamssoft 18 Newnwick Ave, Rochdale, Lancs. OX11 3GG. Tel: 0705 224034.

# Diskit 5

*Disk users take heart. Here we provide a handy disk routine to convert memory to data statements.*

*By Les Allan*

**A** put me back to all of those readers who noticed that we had printed the incorrect listing with the Diskit 5 article in April 1987 issue. Shipped yours far as not noticing.

You will find reprinted here the full article together with a correct version of the Memory to DATA statements program.

**T**here are occasions when it is desirable to convert a section of memory from machine code to a Basic program containing a re-boost and set of data instructions that represent the original machine's memory.

This program provides the user with the facility to 'read' sections of machine memory to do just that! In fact the Basic loader for this program was produced from the very same routine.

## Using the Program

Start and end addresses are entered to control the range of memory to be converted. These are FORK'd into the machine code routine resident at 5800 and re-locates the Basic loader and performs the operation of 'reading' each byte to provide its own hex number as in the data statement e.g.

```
8000 00 00 00 00 43 42 40 00
18 DATA 00,00,00,40,42,40
```

This process is repeated for every byte within the range as previously specified. The completed data listing is then saved to disk as DATA and should be re-loaded prior to running to establish a set of variables which begins at the end of the Basic loader.

The \$N\$ address contained in the Basic loader is the warm start address and should be modified to that required by the nature of the area of memory being converted.

The program must be typed in exactly as listed and saved prior to

running. Error trap routines are included to ensure that the data read is correct. The program, when run, stores the relevant code at a temporary

address of 58000 and when prompted relocates the working program to Basic (58000) and saves to the program to disk. 10

```

PROG001: 000-0000 B000
00 00 00 00-0000 00-0000 00-00 00
01 21 20 10 00 00 00 00 00 00 00 00
02 11 20 10 00 00 00 00 00 00 00 00
03 00 00 00 00 00 00 00 00 00 00 00
04 00 00 00 00 00 00 00 00 00 00 00
05 00 00 00
06 20 10 00 00 00 00 00 00 00 00 00
07 00 00 00
08 10 20 10 00 00 00 00 00 00 00 00
09 00 00 00 00 00 00 00 00 00 00 00
10 00 00 00 00 00 00 00 00 00 00 00
11 00 00 00 00 00 00 00 00 00 00 00
12 00 00 00 00 00 00 00 00 00 00 00
13 00 00 00 00 00 00 00 00 00 00 00
14 00 00 00 00 00 00 00 00 00 00 00
15 00 00 00 00 00 00 00 00 00 00 00
16 00 00 00 00 00 00 00 00 00 00 00
17 00 00 00 00 00 00 00 00 00 00 00
18 00 00 00 00 00 00 00 00 00 00 00
19 00 00 00 00 00 00 00 00 00 00 00
20 00 00 00 00 00 00 00 00 00 00 00
21 00 00 00 00 00 00 00 00 00 00 00
22 00 00 00 00 00 00 00 00 00 00 00
23 00 00 00 00 00 00 00 00 00 00 00
24 00 00 00 00 00 00 00 00 00 00 00
25 00 00 00 00 00 00 00 00 00 00 00
26 00 00 00 00 00 00 00 00 00 00 00
27 00 00 00 00 00 00 00 00 00 00 00
28 00 00 00 00 00 00 00 00 00 00 00
29 00 00 00 00 00 00 00 00 00 00 00
30 00 00 00 00 00 00 00 00 00 00 00
31 00 00 00 00 00 00 00 00 00 00 00
32 00 00 00 00 00 00 00 00 00 00 00
33 00 00 00 00 00 00 00 00 00 00 00
34 00 00 00 00 00 00 00 00 00 00 00
35 00 00 00 00 00 00 00 00 00 00 00
36 00 00 00 00 00 00 00 00 00 00 00
37 00 00 00 00 00 00 00 00 00 00 00
38 00 00 00 00 00 00 00 00 00 00 00
39 00 00 00 00 00 00 00 00 00 00 00
40 00 00 00 00 00 00 00 00 00 00 00
41 00 00 00 00 00 00 00 00 00 00 00
42 00 00 00 00 00 00 00 00 00 00 00
43 00 00 00 00 00 00 00 00 00 00 00
44 00 00 00 00 00 00 00 00 00 00 00
45 00 00 00 00 00 00 00 00 00 00 00
46 00 00 00 00 00 00 00 00 00 00 00
47 00 00 00 00 00 00 00 00 00 00 00
48 00 00 00 00 00 00 00 00 00 00 00
49 00 00 00 00 00 00 00 00 00 00 00
50 00 00 00 00 00 00 00 00 00 00 00
51 00 00 00 00 00 00 00 00 00 00 00
52 00 00 00 00 00 00 00 00 00 00 00
53 00 00 00 00 00 00 00 00 00 00 00
54 00 00 00 00 00 00 00 00 00 00 00
55 00 00 00 00 00 00 00 00 00 00 00
56 00 00 00 00 00 00 00 00 00 00 00
57 00 00 00 00 00 00 00 00 00 00 00
58 00 00 00 00 00 00 00 00 00 00 00
59 00 00 00 00 00 00 00 00 00 00 00
60 00 00 00 00 00 00 00 00 00 00 00
61 00 00 00 00 00 00 00 00 00 00 00
62 00 00 00 00 00 00 00 00 00 00 00
63 00 00 00 00 00 00 00 00 00 00 00
64 00 00 00 00 00 00 00 00 00 00 00
65 00 00 00 00 00 00 00 00 00 00 00
66 00 00 00 00 00 00 00 00 00 00 00
67 00 00 00 00 00 00 00 00 00 00 00
68 00 00 00 00 00 00 00 00 00 00 00
69 00 00 00 00 00 00 00 00 00 00 00
70 00 00 00 00 00 00 00 00 00 00 00
71 00 00 00 00 00 00 00 00 00 00 00
72 00 00 00 00 00 00 00 00 00 00 00
73 00 00 00 00 00 00 00 00 00 00 00
74 00 00 00 00 00 00 00 00 00 00 00
75 00 00 00 00 00 00 00 00 00 00 00
76 00 00 00 00 00 00 00 00 00 00 00
77 00 00 00 00 00 00 00 00 00 00 00
78 00 00 00 00 00 00 00 00 00 00 00
79 00 00 00 00 00 00 00 00 00 00 00
80 00 00 00 00 00 00 00 00 00 00 00
81 00 00 00 00 00 00 00 00 00 00 00
82 00 00 00 00 00 00 00 00 00 00 00
83 00 00 00 00 00 00 00 00 00 00 00
84 00 00 00 00 00 00 00 00 00 00 00
85 00 00 00 00 00 00 00 00 00 00 00
86 00 00 00 00 00 00 00 00 00 00 00
87 00 00 00 00 00 00 00 00 00 00 00
88 00 00 00 00 00 00 00 00 00 00 00
89 00 00 00 00 00 00 00 00 00 00 00
90 00 00 00 00 00 00 00 00 00 00 00
91 00 00 00 00 00 00 00 00 00 00 00
92 00 00 00 00 00 00 00 00 00 00 00
93 00 00 00 00 00 00 00 00 00 00 00
94 00 00 00 00 00 00 00 00 00 00 00
95 00 00 00 00 00 00 00 00 00 00 00
96 00 00 00 00 00 00 00 00 00 00 00
97 00 00 00 00 00 00 00 00 00 00 00
98 00 00 00 00 00 00 00 00 00 00 00
99 00 00 00 00 00 00 00 00 00 00 00
100 00 00 00 00 00 00 00 00 00 00 00

```





# Filemaster

*There are many databases available for Commodore computers and the choice can sometimes be bewildering.*

*To help, we've had a look at Robtek's Filemaster.*

*By George Dawal*

**G**ood basic business packages for the Commodore 64 are few and far between. In particular, good databases are not prolific, mainly because the difference between a normal 'vanilla-style' type database, and a full 'relational' database is more significant than most people think.

If all you want is a database to store names and addresses of friends, which will only need to be called upon occasionally, then almost any simple record system will do. If however, you want to create a variety of fields, and then create reports on the similarities and/or differences between them, then a good relational database is essential.

This latest offering from Robtek, the company responsible for one of the first good multi-purpose cartridges for the Commodore 64, is a relational database for the Commodore 64 and 128. Thankfully, the company has had the good sense to slightly rewrite the program for the 128 so that it takes advantage of the 80 column mode.

Once you have loaded the program for the first time, you are presented with the first of a series of menus, this one being called the Job Menu. The options available from this menu are:

1. Expand file
2. File list on screen
3. Create a new file
4. Close index
5. Searching/changes
6. Change diskette
7. Printing
8. Quit

9. Select another file
- A. Quit
- B. Disk routines

It is advised that first time users should automatically select option 3, however, in use, a disk must first be prepared on which to save your file. Options 1 and 2 are self explanatory, however option 3 is where the user establishes what form the database will take, and therefore requires more description.

## Setting Up

You must first name the six fields and, once this has been done, you can choose the size of each field - in characters - and then the amount of records you intend this database to consist of. In the 128 version of Filemaster, you have the added ability to use generic values, which can then be calculated with.

The close index option is essential to anyone creating a large database as in effect it updates the file each time it is used. If the computer then crashes, you will then at least have created an available index on the floppy. Search is a very standard facility for databases, and it is reasonably well implemented in Filemaster, although it does tend to be quite slow when working on long files.

If, during use, you wish to change disk, you must first close the disk you are working on, and then inform the computer that you are about to change

disks - if necessary, but necessary. To print any or all of your file, option 7 is totally adequate, allowing for the printing of documents or labels. Sorting, another essential part of database is also included in Filemaster, and the sorts seem both good and fast, allowing any file to be organised very simply.

One neat inclusion is the disk routine option. It allows you to delete files, reorganise a disk, format a disk, reset your drive and rename a file. In 128 mode this option will also produce a directory of your drive, and tell you how much free space (in blocks) is available.

## Verdict

Overall, Filemaster is a good, though by no means perfect, relational database. It lacks any form of report generation and thus limits its use for serious applications. What it does, it does well, although the manual is poor, and therefore a few hours of trial and error are necessary to make the most of any database. Nor is it exceptionally cheap. Priced as it is at £29.99, anyone considering purchasing this database should first check if it is suitable for your specific needs. ☺

## Conclusion:

**Robtek Ltd** Unit 4, Johnsons Business Centre, St John Road, Altrincham, M18 7BY. Tel: 01-627 4457. Price: £29.99.

# Arcade Action

Get those sprites moving with these handy arcade routines.

By Tony Crowther

**N**o matter how much time and thought you put into a game it is the quality of the graphics that makes people take a second look at it. If a game has a main character, or sprite, that looks more like a wedge of cheese than the latest hyper-galactic, fusion powered, light ship, complete with glowing engine and flashing lights, the chances are no one will bother to give your game a second look.

The routines presented here will enable you to control a sprite on a C64 with ease. Two routines are presented: the first allows you to animate a sprite, so that you can move legs, helicopter rotors etc. The second routine allows you to move this sprite with ease.

## Animation

In order to animate a sprite all that you are required to do is quickly change the definition of the sprite on the screen to a new one and so on until all of the different animations have been displayed, rather like the way that no animated characters in our last installment.

Let's say that in your latest game you wanted to animate a helicopter. The helicopter and its different animations could look something like the one shown in Figure 1. There are just two animations in our example so all that we need to do is swap between the two sprites in order to make it look as though the rotor is moving around.

The program "SPRITE ANIM LOAD" is a Basic loader for a machine code program that will allow you to achieve this type of animation with ease. For those interested, the machine code for this program is also included for you to follow through.

Sprites that are to be used with the animation routine must be placed in consecutive sprite positions, you can use positions 128 to 200. If you don't know about sprites then I suggest that you take a look at your manual or refer to the *Everyman's Guide to Graphics* article that appeared in the April 1987 issue of *Your Commodore*.

Before you can use the routine presented here you must have first loaded the IRQ/DATABASE program that goes with this series and was published in the March 1987 issue of *Your Commodore*.

The routine presented here allows for eight different sprites to be animated on the screen at once. The sprites for the SYS call to start the animation of a sprite is:

SY530480, No, 1st Sprite Pos, No of frames, Speed

Where:

No is the sprite number, 0 to 7 are allowed.

1st Sprite Pos is the position of the first sprite in memory. You can use sprite positions 128 to 200.

No of frames is the number of

animations that you require. Speed is the speed of the animations, 1 is the fastest and 250 the slowest.

## Procedure

1. Make sure that the IRQ database is running. SY5 48132 turns this on (don't forget to LOAD it first).
2. Tell the IRQ DATABASE that you are using the SPRITE ANIMATE routine by the following command:

```
POKE 836,1
```

3. Start the Animation with the SY5 30480 command as detailed above.

To make things a little clearer I have included the program SPRITE ANIM DEMO. This simply displays a series of sprites on the screen and proceeds to move a dot diagonally across each sprite. This is not very stunning but it does demonstrate the way in which you can use the program.

Now that you can change your sprite looks like, let's get it moving.

## Movement

The routine presented here allows you to move the specified sprite in either a vertical or horizontal direction.

The Basic loader "SPRITE MOVE LOAD" will place the necessary

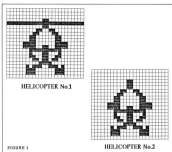


FIGURE 1

HELICOPTER No.2

machine code in memory for the routine. Again I also list the machine code program for those of you who want to see how the program works or use it from within machine code.

The way to start a sprite moving is with the command:

```
SET $0100,No x,y,shi,die,speed,distance
```

Where:

No is the number of the sprite to move, 0 to 3.

X and Y are the x and y co-ordinates of the sprite.

SHI should be either a zero or one. A one is required if the sprite is over 255 pixels along the horizontal axis towards the right of the screen. See your manual for more details of this. Distance is a number between 0 and 255:

0 is up the screen.  
1 is left.  
2 is down.  
3 is right.

Speed should be between 1 and 255. 1 is the fastest and 255 the slowest. Distance is the number of pixels across which you want to move the sprite. For example if I will move the sprite 0 pixels and 180 will move the sprite 180 pixels from the screen.

As with the previous routine you must have set up the IRQ DATABASE program before calling it. Don't forget to make sure that the IRQ DATABASE is switched on and then start this routine with:

```
POKE $371.
```

Again I have produced a boring demo program, "WHITE MOVE DEMO". This demonstration simply sets up a number of coloured blocks and moves them across the screen at different speeds.

## Over To You

I have now given you enough information to allow you to get things moving by yourselves. Careful study of the two demo programs should make things clearer if you are stuck.

To prove to yourselves that you have got to grips with the routines why not try a couple of programming exercises.

1. Try to link together the two demo programs presented here so that the sprites that are moving are also animated.
2. Write a program that moves some sort of vehicle across the screen while animating some part of it,

perhaps a car or a helicopter.

In the next instalment I will show you how I would do each of the above. Plus, I will be taking a look at how to scroll messages and plot on the screen.

## Important Note

As with most programs in this series the IRQ DATABASE program must be present in memory before running any of the programs. The IRQ DATABASE can be found in the March 1987 issue of Four Commodore.

33

## PROGRAM, SPRITE PAIR LIST

00	000	001000,0,190,00,100,00,	
		000,170,0017	
05	001	001000,100,170,00,007,00	
		0,100,00,000	
0C	000	000170,00,100,100,00,00	
		0,000,100,1000	
09	003	003000,100,001,100,007,00	
		1,100,100,1000	
06	004	004000,007,191,100,000,	
		170,00,100,1000	
07	005	005000,000,1,107,007,00	
		0,100,0,000	
0F	006	006000,010,100,007,000,	
		100,170,00,1000	
0F	007	007000,007,100,000,007,	
		000,7,170,1000	
00	008	008000,100,007,100,100,1	
		170,00,100,1000	
0A	009	009000,010,100,007,170,	
		0,0,000,0000	
0A	010	000000,000,0,100,007,00	
		0,000,00,1000	
00	011	000000,100,100,100,100,	
		100,007,000,1000	
00	012	000000,000,00,100,0,107	
		010,100,000	
23	013	000000,000,100,000,100,	
		100,007,000,1000	
00	014	000000,007,0,100,0,107,	
		100,100,000	
00	015	000000,100,100,00,100,1	
		00,100,107,0000	
00	016	000000,7,000,007,0,000,	
		000,00,1000	
28	000	POKE \$3000,0	
0C	001	POKE \$3001,0	
0C	002	POKE \$3002,\$01	
28	003	POKE \$3003,\$01	
0A	004	POKE \$3004,*****	
		*****	
04	005	POKE \$3005,POKE \$3006*	
70	006	POKE \$3007,POKE \$3008 AND	
		POKE \$3009	
07	007	POKE \$3010,POKE \$3011 AND	
		POKE \$3012	
00	008	POKE \$3013,POKE \$3014*	
04	009	POKE \$3015,POKE \$3016 AND	
		POKE \$3017*	
00	010	POKE \$3018,POKE \$3019*	
03	011	POKE \$3020,POKE \$3021 AND	
		POKE \$3022*	
00	012	POKE \$3023,POKE \$3024 AND	
		POKE \$3025*	
00	013	POKE \$3026,POKE \$3027 AND	
		POKE \$3028*	
00	014	POKE \$3029,POKE \$3030 AND	
		POKE \$3031*	
00	015	POKE \$3032,POKE \$3033 AND	
		POKE \$3034*	

```

20 210 PRINTING*****
*****
22 300 L1 = 100 FOR I = 0 TO 2
  0 SPEEDS 210100 1 100 FOR J =
  0 TO 7 SPEEDS 0
24 301 POKE 1+I*255+J*64 AND 160
  1 J, AND 160 AND 160 AND 160
  "ERROR ON LINE " I: END
26 300 L1 = 1+I*255+J*64
  
```

SPEEDS AND Y SPEED

```

1000 *****
1010 **** SPEEDS AND Y SPEED *****
1020 *****
1030 *****
1040 3000 3000 3000
1050 : 3000 : 3000 :
1060 : 3000 : 3000 :
1070 : 3000 : 3000 :
1080 : 3000 : 3000 :
1090 : 3000 : 3000 :
1100 : 3000 : 3000 :
1110 : 3000 : 3000 :
1120 : 3000 : 3000 :
1130 : 3000 : 3000 :
1140 : 3000 : 3000 :
1150 : 3000 : 3000 :
1160 : 3000 : 3000 :
1170 : 3000 : 3000 :
1180 : 3000 : 3000 :
1190 : 3000 : 3000 :
1200 : 3000 : 3000 :
1210 : 3000 : 3000 :
1220 : 3000 : 3000 :
1230 : 3000 : 3000 :
1240 : 3000 : 3000 :
1250 : 3000 : 3000 :
1260 : 3000 : 3000 :
1270 : 3000 : 3000 :
1280 : 3000 : 3000 :
1290 : 3000 : 3000 :
1300 : 3000 : 3000 :
  
```

```

1700 PEEK
1710 LDA #100 CHECK FLAG
1720 BEQ 1800
1730 LDA #0
1740 LDA #0
1750 LDA #0
1760 LDA #0
1770 LDA #0
1780 LDA #0
1790 LDA #0
1800 LDA #0
1810 LDA #0
1820 LDA #0
1830 LDA #0
1840 LDA #0
1850 LDA #0
1860 LDA #0
1870 LDA #0
1880 LDA #0
1890 LDA #0
1900 LDA #0
1910 LDA #0
1920 LDA #0
1930 LDA #0
1940 LDA #0
1950 LDA #0
1960 LDA #0
1970 LDA #0
1980 LDA #0
1990 LDA #0
  
```

PROGRAMS: SPEEDS AND Y SPEED

```

20 1 POKE 20000,0
21 0 POKE 20001,0
22 0 POKE 20002,0
23 0 POKE 20003,0
24 0 POKE 20004,0
25 0 POKE 20005,0
26 0 POKE 20006,0
27 0 POKE 20007,0
28 0 POKE 20008,0
29 0 POKE 20009,0
30 0 POKE 20010,0
31 0 POKE 20011,0
32 0 POKE 20012,0
33 0 POKE 20013,0
34 0 POKE 20014,0
35 0 POKE 20015,0
36 0 POKE 20016,0
37 0 POKE 20017,0
38 0 POKE 20018,0
39 0 POKE 20019,0
40 0 POKE 20020,0
41 0 POKE 20021,0
42 0 POKE 20022,0
43 0 POKE 20023,0
44 0 POKE 20024,0
45 0 POKE 20025,0
46 0 POKE 20026,0
47 0 POKE 20027,0
48 0 POKE 20028,0
49 0 POKE 20029,0
50 0 POKE 20030,0
51 0 POKE 20031,0
52 0 POKE 20032,0
53 0 POKE 20033,0
54 0 POKE 20034,0
55 0 POKE 20035,0
56 0 POKE 20036,0
57 0 POKE 20037,0
58 0 POKE 20038,0
59 0 POKE 20039,0
60 0 POKE 20040,0
  
```

```

1000 *****
1010 *****
1020 *****
1030 *****
1040 *****
1050 *****
1060 *****
1070 *****
1080 *****
1090 *****
1100 *****
1110 *****
1120 *****
1130 *****
1140 *****
1150 *****
1160 *****
1170 *****
1180 *****
1190 *****
1200 *****
1210 *****
1220 *****
1230 *****
1240 *****
1250 *****
1260 *****
1270 *****
1280 *****
1290 *****
1300 *****
1310 *****
1320 *****
1330 *****
1340 *****
1350 *****
1360 *****
1370 *****
1380 *****
1390 *****
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 *****
  
```

```

61 1000 1000 1000
62 1000 1000 1000
63 1000 1000 1000
64 1000 1000 1000
65 1000 1000 1000
66 1000 1000 1000
67 1000 1000 1000
68 1000 1000 1000
69 1000 1000 1000
70 1000 1000 1000
71 1000 1000 1000
72 1000 1000 1000
73 1000 1000 1000
74 1000 1000 1000
75 1000 1000 1000
76 1000 1000 1000
77 1000 1000 1000
78 1000 1000 1000
79 1000 1000 1000
80 1000 1000 1000
81 1000 1000 1000
82 1000 1000 1000
83 1000 1000 1000
84 1000 1000 1000
85 1000 1000 1000
86 1000 1000 1000
87 1000 1000 1000
88 1000 1000 1000
89 1000 1000 1000
90 1000 1000 1000
91 1000 1000 1000
92 1000 1000 1000
93 1000 1000 1000
94 1000 1000 1000
95 1000 1000 1000
96 1000 1000 1000
97 1000 1000 1000
98 1000 1000 1000
99 1000 1000 1000
  
```

PROGRAMS: SPEEDS AND Y SPEED

```

99 100 1000 1000 1000 1000 1000 1000
100 100 1000 1000 1000 1000 1000 1000
101 100 1000 1000 1000 1000 1000 1000
102 100 1000 1000 1000 1000 1000 1000
103 100 1000 1000 1000 1000 1000 1000
104 100 1000 1000 1000 1000 1000 1000
105 100 1000 1000 1000 1000 1000 1000
106 100 1000 1000 1000 1000 1000 1000
107 100 1000 1000 1000 1000 1000 1000
108 100 1000 1000 1000 1000 1000 1000
109 100 1000 1000 1000 1000 1000 1000
110 100 1000 1000 1000 1000 1000 1000
111 100 1000 1000 1000 1000 1000 1000
112 100 1000 1000 1000 1000 1000 1000
113 100 1000 1000 1000 1000 1000 1000
114 100 1000 1000 1000 1000 1000 1000
115 100 1000 1000 1000 1000 1000 1000
116 100 1000 1000 1000 1000 1000 1000
117 100 1000 1000 1000 1000 1000 1000
118 100 1000 1000 1000 1000 1000 1000
119 100 1000 1000 1000 1000 1000 1000
120 100 1000 1000 1000 1000 1000 1000
  
```

```

97 100 1000 1000 1000 1000 1000 1000
98 100 1000 1000 1000 1000 1000 1000
99 100 1000 1000 1000 1000 1000 1000
100 100 1000 1000 1000 1000 1000 1000
101 100 1000 1000 1000 1000 1000 1000
102 100 1000 1000 1000 1000 1000 1000
103 100 1000 1000 1000 1000 1000 1000
104 100 1000 1000 1000 1000 1000 1000
105 100 1000 1000 1000 1000 1000 1000
106 100 1000 1000 1000 1000 1000 1000
107 100 1000 1000 1000 1000 1000 1000
108 100 1000 1000 1000 1000 1000 1000
109 100 1000 1000 1000 1000 1000 1000
110 100 1000 1000 1000 1000 1000 1000
111 100 1000 1000 1000 1000 1000 1000
112 100 1000 1000 1000 1000 1000 1000
113 100 1000 1000 1000 1000 1000 1000
114 100 1000 1000 1000 1000 1000 1000
115 100 1000 1000 1000 1000 1000 1000
116 100 1000 1000 1000 1000 1000 1000
117 100 1000 1000 1000 1000 1000 1000
118 100 1000 1000 1000 1000 1000 1000
119 100 1000 1000 1000 1000 1000 1000
120 100 1000 1000 1000 1000 1000 1000
121 100 1000 1000 1000 1000 1000 1000
122 100 1000 1000 1000 1000 1000 1000
123 100 1000 1000 1000 1000 1000 1000
124 100 1000 1000 1000 1000 1000 1000
125 100 1000 1000 1000 1000 1000 1000
126 100 1000 1000 1000 1000 1000 1000
127 100 1000 1000 1000 1000 1000 1000
128 100 1000 1000 1000 1000 1000 1000
129 100 1000 1000 1000 1000 1000 1000
130 100 1000 1000 1000 1000 1000 1000
131 100 1000 1000 1000 1000 1000 1000
132 100 1000 1000 1000 1000 1000 1000
133 100 1000 1000 1000 1000 1000 1000
134 100 1000 1000 1000 1000 1000 1000
135 100 1000 1000 1000 1000 1000 1000
136 100 1000 1000 1000 1000 1000 1000
137 100 1000 1000 1000 1000 1000 1000
138 100 1000 1000 1000 1000 1000 1000
139 100 1000 1000 1000 1000 1000 1000
140 100 1000 1000 1000 1000 1000 1000
141 100 1000 1000 1000 1000 1000 1000
142 100 1000 1000 1000 1000 1000 1000
143 100 1000 1000 1000 1000 1000 1000
144 100 1000 1000 1000 1000 1000 1000
145 100 1000 1000 1000 1000 1000 1000
146 100 1000 1000 1000 1000 1000 1000
147 100 1000 1000 1000 1000 1000 1000
148 100 1000 1000 1000 1000 1000 1000
149 100 1000 1000 1000 1000 1000 1000
150 100 1000 1000 1000 1000 1000 1000
  
```



# Cross Reference

*The most difficult part of any programmer's work must surely be debugging his product. Cross Reference will help you sort out your variables.*

*By D.J. Zimmer*

**V**ariables are used immeasurable times in programs written by those who use Basic.

However, when it comes to debugging the programs, it can prove a real headache, as you work your way laboriously through a listing trying to track down occurrences of each and every variable.

This Cross Reference program, has been written with the purpose of making this task a whole lot easier.

Cross Reference works by scanning your Basic program and producing a variable name followed by a comprehensive list of lines in which this particular variable occurs. You can do this with all the variables you have used and thus keep track of how your program is structured.

## Getting It In

In order to run the Cross Reference program, enter the following disk-direct mode:

```
LOAD "your prog" (the name of the
Basic program to be listed)
POKE (PEEK(40)+1)*256,0
POKE 44,PEEK(40)+1
LOAD "XSRDEF" (XSRDEF is the
name of the Cross Reference listing)
RUN
```

When the Basic program is running:

1. Enter Y or N (for Yes or No) when asked "Do you want output on printer?"

2. If you have requested output to a printer, you will be asked "What is your program name?". Now enter the name of the program to be listed. The name will appear at the head of the printed listing.

3. Cross Reference will then begin to scan the Basic program. It will indicate its progress by displaying the current line number being processed on the screen.

4. When the scan is complete the Cross Reference will be displayed on the screen. If printed output has been requested, then the printed listing will be produced. If, however, a printed output has not been requested, then, each time the screen has filled with listing, its contents will be held and you will be asked to press the F1 key to continue. When you have pressed F1, the next full screen will be displayed and so on.

5. On very rare occasions, the Basic

program may have too many variables or too many references for the lister to handle.

If there are too many variables then, during step 3, the lister will display the following message:

Dictionary full for var (xxx is the variable name)

If this occurs, then look for the statement:

NN=60

in line 10. NN represents the number of variables that the lister can process. Change the value 60, to accommodate the extra variables.

If there are too many references for a particular variable then, again during step 3, the lister will display the message:

References full for var

If this occurs then look for the statement:

NR=100

in line 10. NR represents the number of references that the lister can handle per variable. Change the value 100, to accommodate the extra references. ☺



# Hex Data Entry II

*An updated version of our machine code entry program.*

*By M.C. Stretton assisted by P.A. Eves*

**T**he Four Commodore Hex Data Entry program has been written with you, the reader in mind. No longer will it be a painstaking ordeal, typing in all the long list of data. This program will ensure a 100% correct entry, each and every time you use it.

It has become apparent that a number of people are experiencing problems using an earlier version of this program. The program presented here is an update of this version and covers any problems that we are aware of.

For your own safety, do not use the first version of Hex Data Entry.

On first entering the Hex Data Entry, only the LOAD DATA and DATA ENTRY options are available to you. This is because the buffer is empty, and the other two options require data to be present. On selecting the LOAD DATA option, you are asked for TAPE or DISK. Press either 'T' or 'D' then RETURN. The program remembers the last Input/Output, and so it is possible to just hit RETURN if the correct device type is being displayed. You are then required to enter a filename.

If you should make an error in your filename entry, you may either delete single characters by the DEL key, or SHIF+CLR+HOME will delete the whole filename. After the prompt, hit return and the file will be loaded into the buffer. The program will allow this up to 35 blocks in length to be loaded

in. If you want larger programs to be entered, you will have to split them into two or more parts first.

The SAVE option is identical to the LOAD, except that it takes the contents of the buffer and saves them out to the given start address. This will save an executable file, that can be loaded and run, independent of the input program.

## Data Entry

The Data Entry option is the option by which you can enter data from Four Commodore, or your own creations. Once this option is selected you are asked if you want to continue from the given address. If you have just 'LOADED' a file, this address will be the next available byte in the buffer. (Allowing you to add more data to the end of the loaded file). Therefore if you wish to continue typing in at the last address, type 'Y'. If 'N' is pressed the program assumes you are starting a fresh entry. When this happens the buffer is reset to zero, thus losing any program currently in memory. If you choose \$C000 as the normal start up address please be aware that most M/C prorgs reside here. After pressing 'N', you are then asked for the starting address, in Hex. Any valid Hex number is acceptable, e.g. \$400, \$C00, \$C000. In this example, the first figure, \$400, would be interpreted as

\$8400 by the program. Likewise \$200 is taken to be \$0200.

Once the start address is given, you are asked if you want checksums or not. If you are typing in a program from Four Commodore your response will be 'Y'.

The screen display now changes to show the current address being pointed into. Type any valid Hex number and the program automatically skips the next byte without the need to type commas, spaces or returns. If you make a mistake, one press of the DEL key will erase the whole number. If in the no checksum mode, when you get to the end of the line, the line will automatically scroll up ready for your next input.

If in checksum mode, after eight bytes are entered you must type the two digit checksum at the end of the line. Unlike the no checksum mode you must press return to enter the line. If the program finds that the checksum does not match the line entered, a warning tone will be sound. You will then be asked if you wish to either: a) Re-enter the line or b) Re-enter the checksum.

After checking your line, if you find you have entered it wrongly, then press 'L'. The line will be erased and you then re-enter it correctly. If you find that you have only made a mistake in typing in the checksum, then press 'C' and re-enter it. Should you wish to stop entering data, simply press return



or space bar on a blank line to get you back to the main menu. How you may SAVE your program so as to restart another day, or you may wish to save a printout.

On choosing the print option, you have a choice of hard copy or screen copy. The listing can be paused at any time by pressing down and holding down any key. Pressing the RUN/STOP key and holding it down will break out of the print mode and return you to the main menu.

The left arrow key (top left of the keyboard), acts as *clear* when typing in your data. The space bar acts as the return key when entering data, thus leaving you free from searching for the return key.

I hope that this program will help to take the drudgery out of typing in long lists of data statements. ☺

## PROGRAM: KEY DATA ENTRY 11

```

00 10 PRINT "*****PROGRAM*****"
01 20
02 30 PRINT "*****PROGRAM*****"
03 40
04 50 PRINT "*****PROGRAM*****"
05 60
06 70 PRINT "*****PROGRAM*****"
07 80
08 90 PRINT "*****PROGRAM*****"
09 99
10 100 PRINT "*****PROGRAM*****"
11 110
12 120 PRINT "*****PROGRAM*****"
13 130
14 140 PRINT "*****PROGRAM*****"
15 150
16 160 PRINT "*****PROGRAM*****"
17 170
18 180 PRINT "*****PROGRAM*****"
19 190
20 200 PRINT "*****PROGRAM*****"
21 210
22 220 PRINT "*****PROGRAM*****"
23 230
24 240 PRINT "*****PROGRAM*****"
25 250
26 260 PRINT "*****PROGRAM*****"
27 270
28 280 PRINT "*****PROGRAM*****"
29 290
30 300 PRINT "*****PROGRAM*****"
31 310
32 320 PRINT "*****PROGRAM*****"
33 330
34 340 PRINT "*****PROGRAM*****"
35 350
36 360 PRINT "*****PROGRAM*****"
37 370
38 380 PRINT "*****PROGRAM*****"
39 390
40 400 PRINT "*****PROGRAM*****"
41 410
42 420 PRINT "*****PROGRAM*****"
43 430
44 440 PRINT "*****PROGRAM*****"
45 450
46 460 PRINT "*****PROGRAM*****"
47 470
48 480 PRINT "*****PROGRAM*****"
49 490
50 500 PRINT "*****PROGRAM*****"
51 510
52 520 PRINT "*****PROGRAM*****"
53 530
54 540 PRINT "*****PROGRAM*****"
55 550
56 560 PRINT "*****PROGRAM*****"
57 570
58 580 PRINT "*****PROGRAM*****"
59 590
60 600 PRINT "*****PROGRAM*****"
61 610
62 620 PRINT "*****PROGRAM*****"
63 630
64 640 PRINT "*****PROGRAM*****"
65 650
66 660 PRINT "*****PROGRAM*****"
67 670
68 680 PRINT "*****PROGRAM*****"
69 690
70 700 PRINT "*****PROGRAM*****"
71 710
72 720 PRINT "*****PROGRAM*****"
73 730
74 740 PRINT "*****PROGRAM*****"
75 750
76 760 PRINT "*****PROGRAM*****"
77 770
78 780 PRINT "*****PROGRAM*****"
79 790
80 800 PRINT "*****PROGRAM*****"
81 810
82 820 PRINT "*****PROGRAM*****"
83 830
84 840 PRINT "*****PROGRAM*****"
85 850
86 860 PRINT "*****PROGRAM*****"
87 870
88 880 PRINT "*****PROGRAM*****"
89 890
90 900 PRINT "*****PROGRAM*****"
91 910
92 920 PRINT "*****PROGRAM*****"
93 930
94 940 PRINT "*****PROGRAM*****"
95 950
96 960 PRINT "*****PROGRAM*****"
97 970
98 980 PRINT "*****PROGRAM*****"
99 990
100 1000 PRINT "*****PROGRAM*****"

```

67	33	071	071	D=ACI1310000107100000<LEFT
		60	60	0000000000000000000000000000000
68	101	8	8	ACI00000100000000000000000000000
		69	69	0000000000000000000000000000000
69	101	2	2	ACI00000100000000000000000000000
		70	70	0000000000000000000000000000000
70	101	8	8	ACI00000100000000000000000000000
		71	71	0000000000000000000000000000000
71	101	2	2	ACI00000100000000000000000000000
		72	72	0000000000000000000000000000000
72	101	8	8	ACI00000100000000000000000000000
		73	73	0000000000000000000000000000000
73	101	2	2	ACI00000100000000000000000000000
		74	74	0000000000000000000000000000000
74	101	8	8	ACI00000100000000000000000000000
		75	75	0000000000000000000000000000000
75	101	2	2	ACI00000100000000000000000000000
		76	76	0000000000000000000000000000000
76	101	8	8	ACI00000100000000000000000000000
		77	77	0000000000000000000000000000000
77	101	2	2	ACI00000100000000000000000000000
		78	78	0000000000000000000000000000000
78	101	8	8	ACI00000100000000000000000000000
		79	79	0000000000000000000000000000000
79	101	2	2	ACI00000100000000000000000000000
		80	80	0000000000000000000000000000000
80	101	8	8	ACI00000100000000000000000000000
		81	81	0000000000000000000000000000000
81	101	2	2	ACI00000100000000000000000000000
		82	82	0000000000000000000000000000000
82	101	8	8	ACI00000100000000000000000000000
		83	83	0000000000000000000000000000000
83	101	2	2	ACI00000100000000000000000000000
		84	84	0000000000000000000000000000000
84	101	8	8	ACI00000100000000000000000000000
		85	85	0000000000000000000000000000000
85	101	2	2	ACI00000100000000000000000000000
		86	86	0000000000000000000000000000000
86	101	8	8	ACI00000100000000000000000000000
		87	87	0000000000000000000000000000000
87	101	2	2	ACI00000100000000000000000000000
		88	88	0000000000000000000000000000000
88	101	8	8	ACI00000100000000000000000000000
		89	89	0000000000000000000000000000000
89	101	2	2	ACI00000100000000000000000000000
		90	90	0000000000000000000000000000000
90	101	8	8	ACI00000100000000000000000000000
		91	91	0000000000000000000000000000000
91	101	2	2	ACI00000100000000000000000000000
		92	92	0000000000000000000000000000000
92	101	8	8	ACI00000100000000000000000000000
		93	93	0000000000000000000000000000000
93	101	2	2	ACI00000100000000000000000000000
		94	94	0000000000000000000000000000000
94	101	8	8	ACI00000100000000000000000000000
		95	95	0000000000000000000000000000000
95	101	2	2	ACI00000100000000000000000000000
		96	96	0000000000000000000000000000000
96	101	8	8	ACI00000100000000000000000000000
		97	97	0000000000000000000000000000000
97	101	2	2	ACI00000100000000000000000000000
		98	98	0000000000000000000000000000000
98	101	8	8	ACI00000100000000000000000000000
		99	99	0000000000000000000000000000000
99	101	2	2	ACI00000100000000000000000000000
		00	00	0000000000000000000000000000000

# Suicide Run

*A tight grip on the joystick and fast reflexes are required to play this superb C64 game.*

*By D.W. Light*

**Y**ou have been unlucky enough to receive a Saint Clair C2.3 from Father Christmas.

Your quest in this fast action game is to collect as many batteries as possible while dodging the landmines, missiles and bomb crates that are out to make your task difficult.

Suicide Run is for the C64 computer and is controlled by a joystick in Port 2. Full instructions for control are included in the game.

### Getting It In

Suicide Run requires five separate programs. Each of which must be typed in and saved to disk or tape individually. The programs SUICIDE RUN and 0-B BASIC must be typed in using our Syntax Checker, see the Listings article for more information.

The rest of the programs must all be typed in using the Hex Data Entry II program.

If you are using cassette then the programs should be loaded in the following order.

- 1) SUICIDE RUN
- 2) M/CODE
- 3) SCREENS
- 4) MNP/CCHR
- 5) 0-B BASIC

To RUN the program you simply need to LOAD and RUN the program "SUICIDE RUN". ☺

```
PROGRAM: 0-B LOADER
10 0 BATTERY BUB LOADER ** D.W.
11 ***
12 PRINT DONE(17)+CHR(107)+B
13 PRINT(108)
14 FOR I=10 TO 500 STEP 10:GOTO 15
15 IF I=10 THEN PRINT "*****",I,1:GOTO
16 GOTO 14
17 FOR I=10 TO 500 STEP 10:GOTO 18
18 IF I=10 THEN PRINT "*****",I,1:GOTO
19 GOTO 17
20 FOR I=10 TO 500 STEP 10:GOTO 21
21 IF I=10 THEN PRINT "*****",I,1:GOTO
22 GOTO 20
23 FOR I=10 TO 500 STEP 10:GOTO 24
24 IF I=10 THEN PRINT "*****",I,1:GOTO
25 GOTO 23
26 FOR I=10 TO 500 STEP 10:GOTO 27
27 IF I=10 THEN PRINT "*****",I,1:GOTO
28 GOTO 26
29 FOR I=10 TO 500 STEP 10:GOTO 30
30 IF I=10 THEN PRINT "*****",I,1:GOTO
31 GOTO 29
32 FOR I=10 TO 500 STEP 10:GOTO 33
33 IF I=10 THEN PRINT "*****",I,1:GOTO
34 GOTO 32
35 FOR I=10 TO 500 STEP 10:GOTO 36
36 IF I=10 THEN PRINT "*****",I,1:GOTO
37 GOTO 35
38 FOR I=10 TO 500 STEP 10:GOTO 39
39 IF I=10 THEN PRINT "*****",I,1:GOTO
40 GOTO 38
41 FOR I=10 TO 500 STEP 10:GOTO 42
42 IF I=10 THEN PRINT "*****",I,1:GOTO
43 GOTO 41
44 FOR I=10 TO 500 STEP 10:GOTO 43
45 IF I=10 THEN PRINT "*****",I,1:GOTO
46 GOTO 44
47 FOR I=10 TO 500 STEP 10:GOTO 44
48 IF I=10 THEN PRINT "*****",I,1:GOTO
49 GOTO 47
```

```
0001 00 00000000, 117 POK0000,
218 POK0000, 0-END
PROGRAM: M/CODE
0000 00 00 00 00 00 70 00 00 00 00 00
0001 10 00 00 00 00 15 00 00 00 00 00
0002 00 00 00 00 00 00 51 00 50 50 00
0003 00 00 11 00 00 00 00 00 11 00 00
0004 00 00 00 00 00 10 00 00 00 00 00
0005 00 00 00 00 00 00 00 00 00 00 00
0006 00 00 00 00 00 00 00 00 00 00 00
0007 00 00 00 00 00 00 00 00 00 00 00
0008 00 00 00 00 00 00 00 00 00 00 00
0009 00 00 00 00 00 00 00 00 00 00 00
0010 00 00 00 00 00 00 00 00 00 00 00
0011 00 00 00 00 00 00 00 00 00 00 00
0012 00 00 00 00 00 00 00 00 00 00 00
0013 00 00 00 00 00 00 00 00 00 00 00
0014 00 00 00 00 00 00 00 00 00 00 00
0015 00 00 00 00 00 00 00 00 00 00 00
0016 00 00 00 00 00 00 00 00 00 00 00
0017 00 00 00 00 00 00 00 00 00 00 00
0018 00 00 00 00 00 00 00 00 00 00 00
0019 00 00 00 00 00 00 00 00 00 00 00
0020 00 00 00 00 00 00 00 00 00 00 00
0021 00 00 00 00 00 00 00 00 00 00 00
0022 00 00 00 00 00 00 00 00 00 00 00
0023 00 00 00 00 00 00 00 00 00 00 00
0024 00 00 00 00 00 00 00 00 00 00 00
0025 00 00 00 00 00 00 00 00 00 00 00
0026 00 00 00 00 00 00 00 00 00 00 00
0027 00 00 00 00 00 00 00 00 00 00 00
0028 00 00 00 00 00 00 00 00 00 00 00
0029 00 00 00 00 00 00 00 00 00 00 00
0030 00 00 00 00 00 00 00 00 00 00 00
0031 00 00 00 00 00 00 00 00 00 00 00
0032 00 00 00 00 00 00 00 00 00 00 00
0033 00 00 00 00 00 00 00 00 00 00 00
0034 00 00 00 00 00 00 00 00 00 00 00
0035 00 00 00 00 00 00 00 00 00 00 00
0036 00 00 00 00 00 00 00 00 00 00 00
0037 00 00 00 00 00 00 00 00 00 00 00
0038 00 00 00 00 00 00 00 00 00 00 00
0039 00 00 00 00 00 00 00 00 00 00 00
0040 00 00 00 00 00 00 00 00 00 00 00
0041 00 00 00 00 00 00 00 00 00 00 00
0042 00 00 00 00 00 00 00 00 00 00 00
0043 00 00 00 00 00 00 00 00 00 00 00
0044 00 00 00 00 00 00 00 00 00 00 00
0045 00 00 00 00 00 00 00 00 00 00 00
0046 00 00 00 00 00 00 00 00 00 00 00
0047 00 00 00 00 00 00 00 00 00 00 00
0048 00 00 00 00 00 00 00 00 00 00 00
0049 00 00 00 00 00 00 00 00 00 00 00
0050 00 00 00 00 00 00 00 00 00 00 00
```

```
0051 00 00 00 00 00 00 00 00 00 00 00
0052 00 00 00 00 00 00 00 00 00 00 00
0053 00 00 00 00 00 00 00 00 00 00 00
0054 00 00 00 00 00 00 00 00 00 00 00
0055 00 00 00 00 00 00 00 00 00 00 00
0056 00 00 00 00 00 00 00 00 00 00 00
0057 00 00 00 00 00 00 00 00 00 00 00
0058 00 00 00 00 00 00 00 00 00 00 00
0059 00 00 00 00 00 00 00 00 00 00 00
0060 00 00 00 00 00 00 00 00 00 00 00
0061 00 00 00 00 00 00 00 00 00 00 00
0062 00 00 00 00 00 00 00 00 00 00 00
0063 00 00 00 00 00 00 00 00 00 00 00
0064 00 00 00 00 00 00 00 00 00 00 00
0065 00 00 00 00 00 00 00 00 00 00 00
0066 00 00 00 00 00 00 00 00 00 00 00
0067 00 00 00 00 00 00 00 00 00 00 00
0068 00 00 00 00 00 00 00 00 00 00 00
0069 00 00 00 00 00 00 00 00 00 00 00
0070 00 00 00 00 00 00 00 00 00 00 00
0071 00 00 00 00 00 00 00 00 00 00 00
0072 00 00 00 00 00 00 00 00 00 00 00
0073 00 00 00 00 00 00 00 00 00 00 00
0074 00 00 00 00 00 00 00 00 00 00 00
0075 00 00 00 00 00 00 00 00 00 00 00
0076 00 00 00 00 00 00 00 00 00 00 00
0077 00 00 00 00 00 00 00 00 00 00 00
0078 00 00 00 00 00 00 00 00 00 00 00
0079 00 00 00 00 00 00 00 00 00 00 00
0080 00 00 00 00 00 00 00 00 00 00 00
0081 00 00 00 00 00 00 00 00 00 00 00
0082 00 00 00 00 00 00 00 00 00 00 00
0083 00 00 00 00 00 00 00 00 00 00 00
0084 00 00 00 00 00 00 00 00 00 00 00
0085 00 00 00 00 00 00 00 00 00 00 00
0086 00 00 00 00 00 00 00 00 00 00 00
0087 00 00 00 00 00 00 00 00 00 00 00
0088 00 00 00 00 00 00 00 00 00 00 00
0089 00 00 00 00 00 00 00 00 00 00 00
0090 00 00 00 00 00 00 00 00 00 00 00
0091 00 00 00 00 00 00 00 00 00 00 00
0092 00 00 00 00 00 00 00 00 00 00 00
0093 00 00 00 00 00 00 00 00 00 00 00
0094 00 00 00 00 00 00 00 00 00 00 00
0095 00 00 00 00 00 00 00 00 00 00 00
0096 00 00 00 00 00 00 00 00 00 00 00
0097 00 00 00 00 00 00 00 00 00 00 00
0098 00 00 00 00 00 00 00 00 00 00 00
0099 00 00 00 00 00 00 00 00 00 00 00
0100 00 00 00 00 00 00 00 00 00 00 00
```















```

4000 00 77 00 07 00 00 00 00 00
4100 00 71 00 00 00 70 00 00 00
4200 00 75 00 00 71 00 00 00 00
4300 00 00 00 00 00 00 01 15 01
4400 15 00 00 00 00 00 01 00 00
4500 00 00 10 00 00 00 00 00 00
4600 00 00 00 00 00 00 00 00 00
4700 00 00 00 00 10 00 00 00 00
4800 07 10 00 07 00 07 00 07 00
    
```

PROGRAM: 5-B BASIC

```

70 0 00*****
80 1 00***** FOR BAN BAN00
90 0 00***** BY 0.0.1.0000
10 3 00***** FOR YOUR CODED
11 00*****
12 0 00*****
13 00 *****
14 00 *****
15 00 *****
16 00 *****
17 00 *****
18 00 *****
19 00 *****
20 00 *****
21 00 *****
22 00 *****
23 00 *****
24 00 *****
25 00 *****
26 00 *****
27 00 *****
28 00 *****
29 00 *****
30 00 *****
31 00 *****
32 00 *****
33 00 *****
34 00 *****
35 00 *****
36 00 *****
37 00 *****
38 00 *****
39 00 *****
40 00 *****
41 00 *****
42 00 *****
43 00 *****
44 00 *****
45 00 *****
46 00 *****
47 00 *****
48 00 *****
49 00 *****
50 00 *****
51 00 *****
52 00 *****
53 00 *****
54 00 *****
55 00 *****
56 00 *****
57 00 *****
58 00 *****
59 00 *****
60 00 *****
61 00 *****
62 00 *****
63 00 *****
64 00 *****
65 00 *****
66 00 *****
67 00 *****
68 00 *****
69 00 *****
70 00 *****
71 00 *****
72 00 *****
73 00 *****
74 00 *****
75 00 *****
76 00 *****
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# ED on CP/M

*The text editor on CP/M is a complex beast, but without  
it you'll soon come unstuck.*

*By Microsoft AppleII*

**E**D is possibly the most complex and feared transient command in the CP/M repertoire. Without this command there's very little you can do in the field of direct CP/M programming. ED is the text editor on CP/M, and is probably the most awkward one ever invented, but it's still necessary to learn how to use it.

ED was designed in 1973 and has some of the user-friendly attributes of more modern systems.

## How It Works

ED is a context editor that deals with a text memory buffer, an input file, and an output file. Characters of text are passed from the input file, through the buffer where they are acted upon, and out to the output file. Occasionally, you need never even see the text!

The facility for passing through a few lines at a time is mainly a hangover from earlier CP/M systems that had little in the way of memory. ED on the C128 can cope with as much as 40K, in the buffer area, any file that will not fit into this is beyond the scope of ED.

From here on, I shall assume that you want to edit a pre-created file that is shorter than 40K. The principal for creating a new file is the same except that you start with an empty file.

To invoke ED you type its name followed by a valid point filename with no wildcard characters. This can then be followed by either the output filename if it is to be different from the input name — or a drive specification if the file is to be output on to a different drive, other than the current default drive. In any other case, the output filename will be the same as the input filename and, at the end, the original file will be overwritten by the new file.

If a separate output filename is specified it must not already exist, otherwise the ED will tell you to erase

it and drop you out to the new system.

If all goes well you will see the ED prompt. If it is a new file, then ED will also say 'New File' to remind you. The ED prompt is:

**>**  
Note the leading space, this becomes significant later.

One word of warning. Check that you have plenty of space left on your disk. If you don't ED will come up with an error message and all will be lost.

## In working order

Despite having specified a filename for input, there is still nothing in the computer for you to play with. You have to load it in using the Append command of A.

For our purposes, this comes in two formats: **ah** where a line is appended into the buffer; or **A** which will load the entire file into the buffer and is the command you are much more likely to use.

Once the buffer is full of text you can start to edit. ED works on the concept of a character pointer or CP. This is similar to the cursor except that it works on the whole buffer, so you can't actually see it. Most commands deal with moving the CP or functioning in relation to the CP — deleting from it, inserting at it etc.

**ah,ah**: Delete *n* characters before (-) or after the CP (D).

## Commands

Here, I will give a list of commands which will come in useful when you are working with CP/M.

**ah, F &**: Append *n* lines to buffer.

**R, R**: Move CP to bottom (-) or beginning (B) of buffer.

**ah, nC**: Move CP *n* characters

forward (C) or backwards (-C) through buffer.

**ah, nD**: Delete *n* characters before (-) or after the CP (D).

**E**: Exit ED, saving any changes into a new file.

**ah/string** **Z**: Finds *n*th occurrence of character 'string', terminated with CTL-Z. Existing *n* finds the first string.

**I**: Enter insert mode. Enter CTL-Z to return to normal mode.

**string** **Z**: Insert character 'string' at CP, terminated by CTL-Z. If the 'I' is uppercase then all output is forced to uppercase. Lowercase 'I' leaves all input as typed.

**I**: Justapos, this is a rather complex command and takes the form of 'Zinsert-string' 'Zinsert-string' 'Zdelete-string' where *n* is the nth occurrence of the search-string or the first is omitted. It finds the search-string, searches forwards to find the first occurrence of the delete-to-string and then replaces all intervening text with the insert-string.

**ah,ah**: Deletes (Kills) *n* lines to and from the CP. Functions in the same way as D but on a line level.

**ah,ahLDR**: Moves the CP *n* lines forward (L) or backward (-L) through the buffer. DL moves to the beginning of the current line.

**L**: Same function as 'L' but displays the line.

**ah**: Moves to absolute line *n* and displays it.

**ah/strng** **Z**: Similar to 'F' except that the search is extended to cover the source file on disk. It's much easier to keep the whole file in memory and use 'F'. Command 'F' needs to be used after using this command to clear up the main.

**O**: Original file. Abandons all changes made in this session and restores the original file. ED will usually ask for confirmation after this command has been used.

**MF=PF:** Move the CP/M files forwards (P) or backwards (B) and display them on screen.

**Q:** Quit, returns to CP/M and abandons all changes made in a similar manner to G.

**R:** Search, takes the form "string1" / "string2" where string1 will be replaced by string2 for the first occurrence of string1 that are found. If n is not specified then only the first found occurrence of string1 is used. If % will replace all occurrences. If S is uppercase then string2 will be converted to upper case.

**RT=RTOT:** Types in lines forward (F) or backward (-F) on screen. OT types the current line.

**Y,=YOH:** Turns line numbering on (Y) and off (-Y). Line numbers fit into the space before the color described earlier. OT displays the available buffer space and how much has been used.

That sums up all the various general editing commands. Remember, a number before a command usually assumes an I, a hash symbol (#) usually means the end of the file, all of the file, or 65535 depending

on context, and may be allowed as a valid number but has a special meaning.

### Complex Commands

As well as these simple editing commands there are a few complex commands for file manipulation.

**H:** Kills the old file and re-opens ED using the new file as the origin file.

**M:** This is the macro command. Command letters can follow the M separated by C/R-Zs where CRS would normally fit in. Sequence is executed in times.

In this command is followed by either the E, L, or T commands and is a "through-or" command working in an absolute manner on these commands rather than in the usual relative way. Can be compounded with r/c with some interesting results.

**Kfile ^ Z:** This command will read a library file into the top of the buffer. Library files can be anything, though ED assumes X888888.LIB as a default file name.

**W:** Writes n lines from the buffer into the new file.

**Wfile ^ Z:** Writes or appends n lines to

the library filename specified, same defaults as K.

**Ufile ^ Z:** Deletes the file from the disk.

**W:** Waits n seconds. Useful in slowing down multiple M commands to see what is actually happening.

### ED Errors

If ED comes into any problems then the message "BREAK "N" AT C" is displayed, where "N" is the command letter last used, and "C" is a character representing the error. Here is a list of common errors:

- # : Failed search, F, S, or N cannot find the specified string.
- %: Unrecognized command letter.
- 0: No pre-created LIB file for R to find.
- > : Buffer full.
- E: Command aborted.
- F: File error.

ED can also display CP/M errors. As is usual with CP/M errors, recovery is unlikely.

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Mark 'Madman' Easton before the start.

### It Cost A Million

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After a fortune had been spent on the promotion of this product for the Christmas market the accompanying photo shows just where the Product Manager Mark Easton ended up.

We are sure that you can come up with some witty comment that Mark Easton could possibly be trying. A four goes to the person who we think provides the best caption before Friday 31st July.

Entries should be sent to: Your Commodore, Cost a Million Caption Competition, 1 Golden Square, London W1R 3AB.

### Next Month

Have you sent in witty captions to our recent competitions? Could you have won a five? Next month we will be printing what we consider to be the best captions to the competitions run over the last few months. You'll have to wait until then to find out.

### QCMP5!

We have had a number of queries about programs which appeared in the June 1987 issue of Your Commodore. Below you will find the necessary information for any articles with errors.

### Emulator 64

Unfortunately a line was missing from the machine code from this article. The missing line was 7700 and is reproduced in full below:  
7700-0077 0A 0A 0A 0A 8D44: 1D

### Smart Lister

The commands for appending the lister program to your own had a slight error in them. If you use a commercial append program such as an extended Basic to merge the programs together you will have had no problems. If you want to use the instructions as printed in the magazine this is what you should do:

- 1) LOAD the program that is to be printed.
- 2) Merge the Smart Lister program to the program to be printed by entering the following commands: POK143:POK145:POK144, PEEK146)  
LOAD the Smart Lister program.  
Enter the following commands: POK143:POK144:5
- 3) The two programs will now be merged and you will be able to produce your listing by entering: GO TO 67995

### List Enhancer

A small error crept into the list of commands for this program. The key to press in order to list the first page of a program is 'V' and not 'I' as stated in the text.

### Analyser 128

A number of people have been in touch praising the facilities of the Analyser program but are at a loss how to start the program running. Unfortunately the instructions on how to start the program were missing from the text.

In order to start the Analyser program working you should enter the machine with the command M0391 T038 and then type C:RA00 to start the program running, after you have loaded the program as the instructions with the article state.

Your Commodore Incorporating Your 64 is a monthly magazine appearing on the first Friday of each month.

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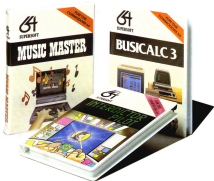
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