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Lt. Blitzer	3rd down	1st and 10	10-0
Lt. Blitzer	4th down	1st and 10	10-0
Lt. Blitzer	1st down	1st and 10	10-0
Lt. Blitzer	2nd down	1st and 10	10-0
Lt. Blitzer	3rd down	1st and 10	10-0
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All and Order



The Game: Summer Edition

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ABC

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Data Statements

Good IDEAS

The Cleveland Information
 Technology Centre has
 launched a free, on-line information-
 database system. Called
 IDEAS for short, the full title
 is the ITEC Data base, Electro-
 nics Access System.

Designed by the Cleveland
 ITEC supervisor, Graham
 Robinson, IDEAS allows users
 to create their own bulletin
 boards and electronic informa-
 tion exchange centres through
 which information can be
 shared or sought on a variety
 of subjects. The system has
 been designed to appeal to
 specific interest groups, such as
 teachers, engineers and busi-
 nesses, but certain areas will
 offer open access to the general
 public.

Closed user groups will be
 required to pay an initial fee for
 registration charges but future
 access will be free. The contents
 of the databases are determined
 and compiled by the users and
 any computer/modem combina-
 tion can be used as long as
 they support the IDEAS pro-
 tocol of scrolling TTY, 800/800
 baud, seven bit, even parity
 with one stop bit.

IDEAS can be accessed any
 any time of day or night on
 (0642) 519704.

Facsimile: Graham Robinson,
 Cleveland Information Tech-
 nology Centre, Sun Alliance
 House, 16-22 Albert Road,
 Middlesbrough, Cleveland TS7
 1PR. Tel (0642) 512150 Ext 26.

Bookshelf

With fewer shops stocking a
 range of computer books,
 Computer Manuals are ready
 to supply users' needs by sup-
 plying a reasonable range of C64
 and C128 books from their
 latest catalogues. Included in the
 range are the Commodore 64
 Programmer's Reference
 Guide, Weber System's C128
 Programmer's Guide plus the
 Anatomy Books from First
 Publishing for the 1341 and
 1351 disk drives.

**Touchline Computer Manu-
 als, 35 Lincoln Rd, Olfen,
 Birmingham B17 6PA. Tel
 051-708 8000.**

CDS Attack

At a recent press launch held
 at the National Army Museum,
 CDS announced the release of
 their latest computer board-
 game, Tank Attack.

The game involves the
 rivalry between two fictional
 countries who decide that the
 only solution to their differ-
 ences lies in armed conflict. With
 the computer acting as moder-
 ator and graphic aid, the main
 action takes place on a playing
 board, using small plastic tanks
 and armoured cars. Each player
 can move pieces around the
 board according to the compu-
 ter's movement allowance. Bat-
 tles can be fought by informing
 the computer of the weaponry
 involved, range and nationality
 of the combatants. Acting on
 this, the computer displays the
 fight on the screen and decides
 the outcome. At the end of each

day's fighting, the computer
 also displays a summary in the
 form of a newspaper page.

CDS kicked off the compu-
 ter board game two years ago
 with Brian Clough's Football
 Fortunes and CDS hope that

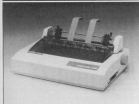
Tank Attack will repeat the
 success.

**Touchline: CDS, 46A Bexley
 Road, Danvers, 5 Yorks. Tel
 01937-211411**



An Armania Tank Attack battle on
 the enemy headquarters

New Citizen



The latest Citizen printer for home, small business or education use has been designed and constructed in Britain. With facilities for all of the European and Scandinavian alphabet options, Citizen is claiming that the 1808 is a truly European printer.

Supporting the alphabets, the machine also offers two resident typefaces in either draft or NLQ modes as well as the usual variants of italics, boldface, condensed and enlarged styles. The quadruple size printing capability has been enhanced so that double and quadruple height and width can be combined in various ways

to produce styles suitable for poster printing.

The printer employs a pull tractor-feed which can be removed to allow single sheets to be used individually in the friction drive, or to be fed in bulk from a hopper which is offered as an optional extra. Awkward paper types, such as address labels, can be used via the special bottom feeder provision.

The Citizen 1808 retails for £229 plus VAT.

Touchline: *Citizen Europe, Wellington House, 4-18 Cromwell Road, Didsbury, Manchester M20 2JX. Tel: (061) 776121.*

Integrated Combat

The final stages in producing F-16 *Combat Pilot* were helped immensely when Digital Integration's team had detailed discussions with the chief test pilot for General Dynamics, the manufacturer of the F-16.

Such attention to detail has been one of the parameters for the game's designers but this latest development adds to the invaluable help of Bill Gunston, a respected author on aviation, and puts the seal of quality on the game, in the opinion of David Marshall, Director of

"We are very grateful for the assistance we have received

from both General Dynamics and the F-16 pilots. Our game is going to be the closest you can get to flying this awesome aircraft without leaving your room."

F-16 *Combat Pilot* will soon be available for the Old on cassette at £14.95 and the disk version will cost £19.95. The Amiga version will follow within the next few months.

Touchline: *Digital Integration, Waterhouse Trade Centre, Waterhouse Road, Camberley, Surrey GU15 1AA. Tel: (0336) 688046.*

Manager Plus

Fans of *Football Manager?* can now add further enjoyment to the game with Addictive Games' special *Expansion Kit*. With the aid of the kit, several games can be modified by changing the team names, colours, players' names, sponsors' and the name of the Cup. With a brand new game, additional changes can be made to the starting division of your chosen club, the amount of cash on hand and the points awarded for league wins and draws.

The new program also has saved games for the Scottish, French, Italian and World League and will be released in February. The *Football Manager 2 Expansion Kit* will be available on cassette and disk for £8.99 and £9.99 respectively.

Touchline: *Prime Leisure Corporation, Unit 1, Baird Road, Ryfield, Middlesex TW1 1XJ. Tel: 01-894 5896.*

Superior McGuigan

Superior Software's latest game, *By Fair Means or Foul*, carries an extra competitive edge for those who can succeed in becoming World Champion. Success qualifies the player for a chance to win a boxing trophy, £200 or a certificate signed by Barry McGuigan.

Harry took time out recently to examine Superior's game which allows tricky low tactics when the referee isn't looking. Hopefully, this won't influence his clean fighting style. *By Fair Means or Foul* is available on cassette for £9.95 and the disk version costs £11.95.

Touchline: *Superior Software, Rogger House, Slieve Linn, Lough L37 I.A.X. Tel: (0332) 479433.*

Clean Machine

Computers and TV or monitor screens seem to attract dirt but finding suitable cleaning solutions can be a problem. Accusoft supply a complete cleaning pack which will take care of computers, screens and the disk drive heads, too. The kits come in two varieties, one for 3.5 inch and another for 5.25 inch.

The kits cost £13.96 and the screen wipes are supplied in packs which can be attached to the side of the monitor for easy access.

Touchline: *Accusoft, Nipkor House, London Road, Wotton Bassett, Wokingham, Kent TW15 7RS. Tel: (0732) 882525.*

Mediogenic Move

Activision (UK), the British arm of Mediogenic, have moved from their Hampshire address to Reading. Later in the year, Activision's programmers, Software Studios, will be moving in to the new premises from Southampton.

The new address is Activision (UK) Ltd, Baker House, Manor Farm Road, Reading, Berks RG2 0JX. Tel: (0734) 311666.

Repair Initiative

The South Business Initiative has given a chance for a young company, VSE Technical Services, to set up a new computer repair company. Although Ian Vaudrey and Tim Morris have been repairing computers for some time, their new workshop in the Mercury Asset Management Youth Enterprise Centre provides extra facilities. Explaining these benefits, Ian said, "It provides us with a base with comprehensive back up services such as secretarial, reception, business information and advice. This gives us a chance to concentrate on making a success of our business."

Time Runs Out

The financial problems of the Sport Aid charity has claimed a victim in Code Masters software house. The official computer game which was meant to help the charity was recent as popular as Ben Johnson at a temperance meeting. Not that the game is necessarily bad, indeed many of the reviews have been good, but the higher price of £4.99 which the charity donation necessitated has crippled the sales, according to Code Masters' operations manager, Bruce Ivinis.

The game has been dogged by ill-fortune because, prior to the crash of Sport Aid, the cover which depicted Jesse Owens had to be changed to show Carl Lewis in action. Earlier formal versions of the game have failed to make much of an impact on the Gallup charts and Code Masters' hopes are now pinned on the success of the C64 version.

Founding: Code Masters Software, Lower Farm House, Bromleythorpe, Southam, Wicks CV31 0SS. Tel (0525) 814732.

Real D&D

SSI's *Dungeons Master's Assistant* is intended to assist players of *Advanced Dungeons and Dragons*.

Using this utility, *Dungeons Master* can relieve of the duty of creating and calculating encounters with a wide range of monsters and combatants.

The database contains over 1000 encounters and over 1500 characters and supports monster records and encounters print-outs. The DM can also specify encounters or ask the Assistant to generate random ones. Existing data can be added or modified to suit the user's needs.

Dupe Disks

Following the launch of Commodore branded disks by RPS, pirates have moved in to produce look-alike disk boxes containing inferior products. RPS are understandably annoyed about this sharp practice which is potentially harmful to the reputation of the company and its high quality disk.

Commenting on the situation, Iver Norfolk, UK business manager for RPS, said, "Our initial tests show that these pirate disks are totally inferior in quality and performance and

any users of no-name or unknown brands are going to experience problems. We will ensure the good names of RPS and Commodore will be protected from this kind of con trick."

Purchasers of Commodore branded diskettes should check to see that the box contains the wording "Manufactured by RPS".

RPS, High Street, Houghton, Apple, Awa L18 5QL. Tel (0552) 867322.

The program has been designed to handle most of the number-crunching and will also detail armour and weaponry types, number and types of spells, and treasure and experience points gained in each encounter.

Dungeons Master's Assis-

tant available for the C64 but the price has yet to be announced.

Founding: SSI, US Gold, Unit 2A2, Wolford Way, Wolford, Birmingham B6 7AE. Tel 021-356 2388.

Telesoftware rip

By the time you read this, Telemap, the company that operates Mircronet on the Prestel database, should be providing its subscribers with a new telesoftware service. This is both good and bad news.

The reasons for the changes are numerous. Firstly, the major change will be the lack of commercially priced telesoftware. Previously Mircronet used to supply software from professional producers such as Firebird, though always on a small scale. It would appear that the decision to abandon paid telesoftware was made partly because of lack of support from these software producers. To an extent, the attitude of the software houses is understandable.

Even with the data protection that the Misting downloader provides for Commodore software, it's still relatively easy to duplicate a piece of telesoftware once it's on your disk. Further, software is more and more complex; the

packaging alone, with comprehensive guides and other items, is very attractive, and those who download telesoftware tend to loose out in this respect.

The second major reason for abandoning paid telesoftware is that code for mirrors such as the Amiga tends to be on the large side, and so is very cost saved by purchasing the product as telesoftware can be lost in the time (and money) it takes to download the item.

In its place is a telesoftware gateway. Mircronet won't be charging anything for the software that will be provided, but a time charge of 1p per minute will be levied when using the telesoftware gateway. This time charge will not be applicable between midnight and Sun.

Mircronet say the charge is necessary to cover costs, yet this argument is quite ridiculous for several reasons:

Firstly, since the demise of chargeable telesoftware, Tele-

map encloses (manpower, time, billing etc) has been de-allocated from telesoftware; this must save the company money.

Secondly, frames of telesoftware used to be stored on the Prestel computer, and frames that had to be rented by Telemap from Prestel, is changing over to a gateway system. Telemap must be saving a considerable amount of money.

Thirdly, Telesoftware is a fundamental part of Mircronet. It always has been, ever since the service was first opened over five years ago, and it has long been recognised that free telesoftware (free from ALL charges including phone costs) was something that the subscribers coveted.

Surely Telemap with its savings in manpower costs, frame rental and the recent subscription increases could provide the telesoftware gateway as part of its standard service?

The price of fax

As reported in last month's column, Telecom Gold has now provided a fax facility for its subscribers. It's an ongoing soon-only service at present, but should still prove useful for those who do not wish to invest in a dedicated machine.

Fax messages are charged by the kilocharacter (or part thereof). One kilocharacter = 1024 characters (approximately 2/3 of an A4 page).

The charge varies according to destination:-

UK destinations	4p
European destinations	8p
North American destinations	£1.20
Rest of the World destinations	£1.50

More information, including an on-line user guide, can be found on Telecom Gold by entering INFO FAX, INFO FAX USERS or INFO FAX COUNTRIES at the chevron.

Games Update

The industry is beginning to wake like some slumbering giant, just in time for the expected Christmas rush. Most of the major releases were looked at last month in the Games Supplement, or feature in this month's issue. As a result, there are only a couple of titles in this section.

The game likely to attract most attention is *Typhoon* from Imagine. Based on the Konami arcade game, it features multi-level shoot-em-up action. You start off piloting an F-14 fighter bomber pitting yourself against hordes and hordes of oncoming mechanical aliens. The first section looks most impressive as the game is presented in a head-on perspective, but the gameplay sounds all too familiar. As well as blasting the enemy craft, you can shoot down their air-to-air missiles and pick up bigger and better weapons.

At the end of the level, you have to land an aircraft carrier into oblation before being allowed to

proceed. Then it's all change into a helicopter (why?) for a depressingly familiar top-down, vertically scrolling, bomb-the-ground-installations-and shoot-the-enemy-aircraft affair. There are six more levels of this sort of thing, each one having to be loaded in separately so that non-disk owners might feel that it all becomes a bit tedious when it is finally game-over time.

Wonder from Addictive is a curious blend of pinball and breakout action. A two player game, either against the computer or a friend, you have to manoeuvre your man around the bottom of your half of the screen, attempting to catch a ball as the end of your gun. Catch it anywhere else and you're dead. If caught, the ball can be aimed at a series of blocks above your gun or into several assorted hampers.

Each level is played against the clock, so it's tough luck if you happen to have a good opponent because you

aren't going to see enough of the ball to score sufficient points to progress onto the bonus screen and next level. I must confess to being one of the world's greatest pinball fans and the game has only to be mediocre for me to end up playing it for hours on end. To say that I thought *Wonder from Addictive* should give you some idea of my true feelings.

Another duffer comes from the French company Etn International. *Bubble Blast* is a variant on the old arcade adventure theme. You play a ghost trying to guide a bubble, representing its soul, through a maze of rooms in an old castle. This you do by blowing your soul, rotating your ghost to give you the angle that you require.

Contact with any of the plethora of objects lying around means, not surprisingly, that the bubble bursts. As you progress further, there are puzzles to solve, candles to be blown out, switches to be pulled and that sort of



Typhoon



Bubble Blast

thing.

The game is very gentle and there are several nice graphic touches, but that does not compensate for a basic lack of interesting gameplay. This was the sort of thing that was around three years ago and the industry has come a long way since then.

Budget Games

Quite a few games this month ranging from the good, through the bad to the interminably awful. To inaugurate Dr Johnson, these games are both good and original. Unfortunately, the good ones aren't original and the original ones aren't good!

Without this is, undoubtedly, *The Race Against Time* from Code Masters. Originally written to help with Sport Aid, news has since broken that the company organising Sport Aid has gone bust, owing several million pounds due to the postal dipset. At the time of writing, there is some doubt as to whether the monies donated to charity might all go in paying off creditors, so if you want to make a donation in charity I would suggest that you do so through Oxfam or one of the other agencies.

As for the game itself, you play the *Alvin* runner *Omar Khalifa* in an arcade adventure that takes you round the world. You need to persuade people to join in the race by raising a flag and lighting a flame in each of the five continents. There are assorted puzzles on route and over 100 screens to visit.

As for *Area* on the Klax label puts you behind the controls of a Mosquito fighter bomber in the Second World War. As well as flying the plane, your missions include attacking V1 rockets, U-Boats and enemy trains. You get fully briefed on your mission and must then decide what weapons you are going to load onto your aircraft, choosing these from a combination of bombs, rockets and cannon.

In flight, you have to flip between pilot, navigator and engine screens in order to reach the target. The bombardier screen is only necessary once you have the enemy in view. All that remains to be done after destroying your target in this stereotyped simulation is to fly home and get on with the next mission.

Sports fans could do a lot worse than take a look at *Touch Football*, also on the Klax label. It's a two-*pin*



The Race Against Time

bowling simulation in which up to eight players can compete in a league. There are three different skill levels and the release of the ball uses *Grader-Accord* - type controls for judging direction, speed and degree of hook. The controls operate by releasing the fire button as a sliding scale reaches the desired point. Anyone who has failed miserably to come to terms with the scoring in bowling will be pleased to know that everything is worked out for you.

Another sports program is *Profes-*

sional *Ski Simulator* from Code Masters. This is a reasonable game until you get caught behind an obstacle and it then becomes impossible to see the direction in which you're facing, with the result that it is almost certainly game-over time.

My memories of skateboards are of those things I fell off a lot way back in the 70s. Recently though, there have been a spate of skate board games. From Code Masters again comes *Pro Skateboard Simulator II* wonder how much one gets paid for thinking up



Professional Ski Simulator

Code Master's latest, *Seven* parks, skate board, collect the flags, do a few tricks, beat the clock.

Cheap Skate on the Silverhead label is slightly different - skate down the road, avoid the obstacles, beat the clock, go into the next level, impress the local gang leader. Certainly, I had enough trouble staying on my own board without having to dodge out of the way of malevolent fishbats!

Another blast from the past. Do you remember the *Space Hopper*? A large orange ball, with ears, that you could sit and bounce down the street for five minutes until you got bored with it and started playing football instead. Well *Silverhead* have come up with another one for you - bouncing on top of criminals in *Moppy Coppers*. Up and down the streets you go, using your radar to catch up with the baddies before upstating them. The only trouble was that the radar in my copy bore no relationship whatsoever to the location of the robbers. Apparently, when right on top of them, there wasn't a burglar in sight.

New to *Street Gang* from Playtex. Run through the streets of New York, picking up different weapons and beating up or dodging all the baddies. Seen it all before.

Figure Billy on Silverhead is the old Digital Integration title. Getting a bit long in the tooth now, but still very playable if you are looking for a combat flight simulator at a bargain price.

Pulse Warrior from Mastertronic sees you trying to deflect small pulses of energy into magnifying lenses and then deflecting the resulting, bigger pulses at the alien before moving on to the next screen. Different but not particularly stunning.

The Growing Pains of Adam



Peter Warner



Cheap Skate

Afak, based on the TV series of the book, is available at budget price which now makes it cheaper to buy than the book. Though classed as an adventure, it is little more than a series of multiple choice questions which determine your progression through the story. It's okay to play once but I don't think you'd load it in many more times and I still reckon that the book would give a lot more pleasure.

My hero of the month is *International Rugby Simulator* from Code Masters (you'll soon see why this one wasn't called *Pro Rugby Simulator*). Normally played with 15 men, there is a cut-down version known as *Rugby Seven*, so this right-man version is something of a novelty. As the instructions go on, it talks about three men in the pack and five forwards and you soon begin to wonder if the author has ever played this noble game. Similarly, the constant reference to three-in-

rather than line-outs makes you wonder which sport this simulator was based on.

You can choose all sorts of different formations for your line up, but this is something of a waste of time as it is nigh on impossible to tell which of your men is highlighted and therefore under your control. This is especially true when your side is France wearing their well-known national colours of green. Inevitably, when you do discover which man you are controlling, he is never in the right position and you soon discover that the opponents have run in yet another try. A quote in the packaging claims that this is "the best rugby game, absolutely brilliant" - as it is also the only rugby game currently available, I can confidently claim that it is without doubt the worst rugby game, absolutely horrid!

Gordon Hamilton



The Growing Pains of Adam (Med)

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Byting Into the 6510

To tie up our series on programming in machine language we look at some useful arithmetical techniques, and 6510 bit instructions and also find out about NOP and BRK

By Burghard-Henry Lehmann

In this final article of the series, I'd like to tie the subject up by dealing with a few techniques and some instructions which I haven't dealt with in the previous articles.

Most of these techniques concern 16-bit arithmetic - an area in which the 6510 is notoriously weak.

Adding and Subtracting 16-Bit Numbers

Listing 1 shows you how two 16-bit numbers can be added together.

This works by first clearing the carry flag and then adding the low bytes and the high bytes of the two numbers respectively.

If one of the two numbers is 8-bit you can use the method shown in Listing 2 or you can give the low byte as zero and add it to the low byte of the second number, using the method shown in listing 3.

Subtracting two 16-bit numbers is done in a similar way, as you can see from listings 3 and 4. Only now the carry flag has to be set with SEC, as usual.

If you use the method demonstrated in listing 3 and if the result of the subtraction would be negative, that is, the first number is smaller than the second number. This will be shown by the carry flag being clear at the end of the routine.

Shift and Rotate Instructions

Before I deal with multiplication and division I'd like to deal briefly with a range of 6510 instructions which I haven't touched at all in this series of articles - the so-called bit instructions.

These instructions allow you to manipulate the binary bits separately. As such these instructions are extremely useful for high resolution graphics when you want to manipulate each pixel on the screen separately.

But you can also use some of the bit instructions for some arithmetical purposes, as we will see in a minute.

The most frequently used bit instructions are ASL, LSR, ROL, and ROR, which are also called the shift and rotate instructions.



ASL shifts the bits within a byte which is either in the accumulator or in memory to the left, as shown in figure 1. In arithmetical terms this has the effect that the byte is doubled each time ASL is used.

LSR does the opposite, by shifting the bits to the right, as shown in figure 2. In arithmetical terms this has the effect that the byte is halved each time LSR is used.

One way to use ASL or LSR in graphics, is for a routine which scrolls pixels to the left or to the right respectively. In this way you can get extremely sophisticated looking results.

There are two instructions which rotate the bits right round the byte. That is, the bit which is rotated out on the one side of the byte is rotated back in on the other side. It is as if the byte is the window on an endless conveyor belt.

ROL does this action to the left, as shown in figure 3. In arithmetical terms it too doubles the contents of a byte, but has the advantage, that an overflow is shown in the carry bit. This makes this instruction, and the following one, especially useful for multiplication and division, as we will see later on.

ROR rotates the bits to the right and therefore does the opposite of ROL. In arithmetical terms this has the effect that a byte is halved.

The Logical Instructions

The 6510 instruction set includes three logical instructions: AND, ORA, and EOR.

These instructions are useful in graphic routines when you want to manipulate single pixels on the screen. Initially you bring the bit you want to manipulate into the right position by using a shift or a rotate instruction and then you AND, OR, or EOR the byte, according to the result you want to achieve.

With AND the result is 1 if both bits are 1. If either or both bits are 0, the result is 0. That is:

```
0 AND 0 = 0
0 AND 1 = 0
1 AND 0 = 0
1 AND 1 = 1
```

For example:

```

10010110
AND 10110011
-----
00010110

gives 10010110
```

With ORA (logical OR) the result is 1 if either bit is 1. That is:

```
0 ORA 0 = 0
0 ORA 1 = 1
1 ORA 0 = 1
1 ORA 1 = 1
```

For example:

```

10010110
ORA 10110011
-----
10110111

gives 10110111
```

OR (exclusive OR) works like ORA, except for one: 1 EOR 1 gives 0, and not 1. Thus:

```
1 EOR 0 = 1
0 EOR 1 = 1
1 EOR 0 = 1
1 EOR 1 = 0
```

For example:

```

10010110
EOR 11001011
-----
01011101

gives 01011101
```

EOR gives several interesting results. If you EOR a number with 0 you get the same number as result.

For example:

```

EOR 00000000
gives 10110110
```

If you EOR a number with the same number you get 0 as result. For example:

```

10110110
EOR 10110110
-----
00000000

gives 00000000
```

EOR has an extremely useful property which allows us to make a number disappear by masking it with another number, and then making the same number re-appear by masking the result again with the same mask. For example:

```

1st number 10110110
2nd number or mask EOR 01101000
-----
11001111

gives 11001111
2nd number or mask EOR 01101000
-----
10110110

gives again 10110110
```

The BIT Instruction

Finally there is the BIT instruction which tests memory bits. It changes nothing but has an effect mainly on the zero flag.

Thus, if two bits correspond the zero flag is set. If they don't the zero flag is clear.

As I've mentioned before, all the above instructions are most useful if you want to do high resolution graphics or re-design the character set or design a micrograph routine which gives you more characters in a column than the usual 40 characters and so on.

Multiplication and Division

But there are also some uses with multiplication and division.

This is useful to know because the 6510 has no multiplication or division instructions. Thus, if you want to do multiplication or division you have to write your own routines.

If you simply want to double a byte, you can do so easily by shifting or rotating it to the left with ASL or ROL, respectively.

If you want to half a byte you can do that by shifting or rotating it to the right with LSR or ROR, respectively.

Listing 3 gives you a routine which lets you multiply to single bytes and gives you a 16-bit result. For the first number into zero page 251. You'll get the result of the multiplication in the same two locations.

This routine uses a branch instruction and a flag which we haven't dealt with: BPL, which branches if the negative flag is clear.

The negative flag of the flag register tells if the result of a subtraction or comparison is negative or not. It is set if the result is negative, that is, between 128 and 255. And it is clear if the result is positive, that is, between 0 and 127. (In the second article of this series I have briefly explained that in 8-bit arithmetic a number between 0 and 127 is considered positive, while a number between 128 and 255 is considered negative.)

BMI is the opposite branch instruction to BPL. It branches when the negative flag is set.

Listing 4 gives you a routine which divides a 16-bit number by a 8-bit number. You put the 16-bit number into zero page locations 251 and 252 and the 8-bit number into 253. The result which is assumed to be 8-bit will be in 251, with the rest in 252.

If you want to multiply or divide two 16-bit numbers and get a 16-bit result you'll have to do it the hard way and construct a loop which adds or subtracts by how many times you want to multiply or divide.

Comparisons

Comparing 8-bit numbers is no problem. If you want to compare two 16-bit numbers the trick is to subtract the two numbers from each other. Listing 7 shows you how to do that.

The result of the comparison is given with the status of the zero and the carry flag. If the zero flag is set, both numbers are equal. If the carry flag is clear, the first number is less than the second. If the carry flag is set, the first number is larger than the second.

Thus BRQ, BCC and BCS test for =, < and > respectively.

Last Instructions

Finally I'd like to deal with two instructions which I haven't mentioned so far, NOP and BRK.

NOP does absolutely nothing, except waste time.

This sounds pretty useless, but there are occasions where you want to use NOP. Either you want to waste time on purpose, in order to hold a printer on the screen for long-enough for the user to read it. NOP has the advantage that you can time your wasting of time very precisely. It may therefore also be useful in timing routines in games, etc.

Sometimes NOP can also be useful if you want to temporarily substitute some instructions without changing the locations of the subsequent instructions. This is useful for debugging purposes.

BRK is also used mainly as a debugging device. Whenever it is used the 6501 jumps to the reset routine of the computer. This is similar as if you press RUN/STOP and RESTORE simultaneously.

By changing the vector at \$0014 and then making it jump to your own break routine, you can make the computer jump to whenever you want to whenever BRK is used.

This fact is used by most machine code monitors - whenever BRK is given, the program flow jumps back to the monitor.

As I've said, BRK is useful for debugging purposes. It allows you to interrupt a routine at which ever point you want to in order to see what it has been done so far. For this BRK is more useful than RTS, because if you want to break in the middle of a subroutin, a temporary RTS will only return you to the main program, while BRK will get you right out. ☺

Listing 1 - Adding Two 16-Bit Numbers

```
CLC
LDA low byte 1
ADC low byte 2
STA low byte 2
LDA high byte 1
ADC high byte 2
STA high byte 2
```

Listing 2 - Adding an 8-Bit and a 16-Bit Number

```
CLC
LDA low byte 1
ADC low byte 2
STA low byte 2
BCC no high byte
INC high byte of second number
```

Listing 3 - Subtracting Two 16-Bit Numbers

```
SEC
LDA low byte 1
SBC low byte 2
STA low byte 2
LDA high byte 1
SBC high byte 2
STA high byte 2
```

Listing 4 - Subtracting an 8-Bit Number from a 16-Bit Number

```
SEC
LDA low byte 1
SBC low byte 2
STA low byte 2
BCS no high byte
DEC high byte of second number
```

Listing 5 - Multiplying two 8-Bit Numbers with a 16-Bit Number as result

```
CLC
LDA 0
LDX 0
LOOP
ROB
ROB 251
BCS SKIP
CLC
ADC 252
DEX
BPL LOOP
STA 251
RTS
SKIP
```

Listing 6 - Division of an 16-Bit Number with a 8-Bit Number

```
CLC
LDX 1
LDA 252
ROL 251
ROL
BCS SKIP1
CMP 253
BCC SKIP 2
SBC 253
SKIP1
SEC
DEX
BNE LOOP
ROL 251
STA 252
RTS
```

Listing 7 - Comparing two 16-Bit Numbers

```
SEC
LDA low byte 1
SBC low byte 2
STA temporary
LDA high byte 1
SBC high byte 2
ORA temporary
```

List of instructions explained in this article:

ASL = shift content of accumulator or memory to the left

LSR = shift content of accumulator or memory to the right

ROL = rotate content of accumulator or memory to the left

ROR = rotate content of accumulator or memory to the right

AND = logical AND

ORA = logical OR

EOB = logical exclusive OR

BIT = test memory bits

BPL = branch if negative flag is clear

BMI = branch if negative flag is set

NOP = no operation

BRK = force break

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Captain Blood

Your energy is ebbing away, time is running out, and only the missing clones can save you...



Bob Morlock is desperate. He has just received his quarterly royalties cheque (which came to only \$5c) and needs money fast. After a hasty meeting with Charles Darwin in a bar in Slick City, Bob sets out to program an alien ego called Captain Blood, and completes a giant ship called the Ark complete with his own bioconsciousness. When the program is completed, Bob presses RUN and disappears only to reappear on the Ark, just left of Andromeda, as Captain Blood.

No sooner has he realised what has happened when aliens attack, forcing him into hyperspace, where things begin to go seriously wrong. Suddenly, there are 30 clones of Captain Blood spread throughout the galaxy, with the real one beginning to degenerate through loss of fluid. He's only chance of survival is to track down the clones and absorb their bodily fluid. As the game begins, all but five have been absorbed and it's up to you to complete the mission.

Unfortunately, the galaxy is a big place, containing over 32,000 planets, and so the subtle approach of blasting every planet in sight won't work in time. Instead, you'll have to boldly go and seek out intelligent life in an attempt to find out where these duplicates are before it's too late.

The Ark's controls are activated by a touch of the finger, which is just as well because you're pretty low on fluid (lose that, and with enough control left to guide your ship around the hyperspace lanes of the galaxy, but not enough to land on the planets yourself). But a hefty bit of genetic engineering and a little brainwashing provides you with a supply of baby Dremas that will, with your guidance, run the gauntlet of planetary missile defenses and fly along narrow canyons to make contact with the aliens below.

If your reactions aren't up to scratch, then the poor baby will be spat out against the canyon wall. Don't feel though - there'll be another one along any minute as the birth camp. Should you make contact with the aliens, you then enter the main part of the game as you attempt to talk to them through a series of common language words that appear on the screen. However, some aliens are more intelligent than others, and sometimes you'll get no farther than FOOD and KILL.

Others may have information but will want to bargain for it, which usually means tracking down and destroying an enemy for them - but their money might make a better deal. And so, as you steadily deteriorate, you trade desperately with anyone and anything in the hope of a lead. Eventually this will come, and you'll be able to teleport the first clone into the Frigidarium and absorb him. If not, your own will start to shake as you become weaker and weaker.

Captain Blood first appeared on the Atari ST in the summer, and became the game that you bought an ST to play. Obviously, the Old version lacks the stunning graphics of the original, reducing the fractal flying sequences to line-drawn boredom, but there's enough left in the rest of the game to make it interesting and challenging.

It's certainly different, and music from Jean Michel Jarre adds to the atmosphere as you race against time to absorb the final clones. This is not a game for the faint-hearted.

TR

Franchise:

Title: Captain Blood. **Supplier:** Infogrames, Atari Music, Abbey Road, Exquisite, Midlmore, ENT 2AQ. **Tel:** 01-260 9119. **Machine:** C64/128. **Price:** £34.95 (add.)

Basic Explored

Understanding how Basic works can bring memory saving benefits

Beginners: All-purpose Symbolic Instruction Code or BASIC for short, was originally introduced so that ordinary people could have access to a simple-to-learn and easy-to-use programming language. To this end the language has been 100% successful. However, it does have certain limitations, particularly the version implemented on the C64. The idea of this article though, is not to run down the language, but to try to give a better understanding of its structure within the computer's

memory, with some hints and tips on how to get the most out of the limited amount of memory available for your programs.

Code In Memory

When you're typing in your program, you may wish to view a particular section of it at some time. To do this you give the instruction LIST, and immediately the program begins running past your eyes from start to finish. Obviously, what you see on the screen and what's in the computer's

By Paul Eves

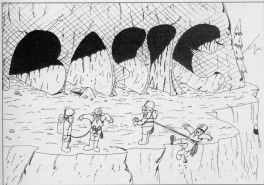


FIGURE 1

Remember, all the values you see here are in hexadecimal notation, not decimal. If you look in the Year Commodore Service Users Guide, there is a conversion table if you wish to convert to decimal.

HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS	HEX ADDRESS
0000	01	02	03	04	05	06	07	08	09
0A	0B	0C	0D	0E	0F	10	11	12	13
14	15	16	17	18	19	1A	1B	1C	1D
1E	1F	20	21	22	23	24	25	26	27
28	29	2A	2B	2C	2D	2E	2F	30	31
32	33	34	35	36	37	38	39	3A	3B
3C	3D	3E	3F	40	41	42	43	44	45
46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59
5A	5B	5C	5D	5E	5F	60	61	62	63
64	65	66	67	68	69	6A	6B	6C	6D
6E	6F	70	71	72	73	74	75	76	77
78	79	7A	7B	7C	7D	7E	7F	80	81
82	83	84	85	86	87	88	89	8A	8B
8C	8D	8E	8F	90	91	92	93	94	95
96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9
AA	AB	AC	AD	AE	AF	B0	B1	B2	B3
B4	B5	B6	B7	B8	B9	BA	BB	BC	BD
BE	BF	C0	C1	C2	C3	C4	C5	C6	C7
C8	C9	CA	CB	CC	CD	CE	CF	D0	D1
D2	D3	D4	D5	D6	D7	D8	D9	DA	DB
DC	DD	DE	DF	E0	E1	E2	E3	E4	E5
E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9
FA	FB	FC	FD	FE	FF				



FIGURE 1

```

10 POKEX100,1-POKEX100,1
20 PRINT"HELLO"
30 PRINT"HELLO EVERYONE"
40 POKEX100,1
50 NEXT
60 PRINT"END OF DEMO"
70 GOTO70
    
```

memory are two different things altogether. Indeed, the lines flashing past your eyes have undergone many changes as their journey from memory to screen. So just how do we get to view the program in memory? On power up the default setting for the start of Basic memory is \$0801 (2048 decimal). So to view let's say the first 30 bytes of memory, you would type something like the following:

```
POKE$0801,$00000;PRINTHEX($0,30);
```

This would be done in direct mode. What you would now see is a series of decimal numbers in the range 0-255. These numbers are the decimal equivalents to the hexadecimal numbers that are stored in memory. These hex numbers are the machine's interpretation to what you typed on the keyboard. To give you a better understanding of this, look at figure 1. This is a single screen line Basic program. Now look at figure 2. This is how that seven line program is stored in the computer's memory. I shall now explain how the program is made up line by line.

Each and every Basic line has an overhead of five bytes, plus the line itself. These five bytes consist of a link address, line number and a trailing zero byte which denotes the end of a line. The link address is used by the system when you're using the screen editor, that is to say, when you are inserting or deleting lines of a Basic program. They are ignored when the program is running (more about the link address later). Now back to our short example.

So what does all this mean? The first question that may spring to mind is: how does the computer know how to pick out the command words? The answer is simple. Command words, or keywords as they are called, have hex values in the range \$7F to \$CB. When you press the return key, the data is sent to the keyboard buffer for interpretation. A look-up table is then used and your line is scanned for the keywords. The more observant of you will now be asking yourselves: What if I type PRINT"PRINT"? Wouldn't this be interpreted as two print statements? The answer is no - one of the jobs of the look-up table is to check on the quotes mode. If a keyword lies between quotes, then it must be within a print statement. Back to our little example.

Memory address \$0800 contains \$00. For Basic to operate correctly, the memory address immediately before the start of Basic memory must contain a zero byte. The next two bytes contain \$17 and \$08. These bytes represent the link address in the usual low byte/high byte format, and tell the computer where the next Basic line starts from. The next two bytes show \$0A and \$00: this is the line number shown once again in the low/high byte format. The next byte is \$90. Remembering what I said about keywords falling in the range of \$F and \$CB, you'll realize that this is a keyword - in fact it's the hex notation for POKEX.

The following five bytes represent the number 52288. The following byte is \$C6, which is interpreted as a comma. Look at the rest of the example, and see if you can follow it through line by line. At first it may seem strange to you, but with practice it should become clearer (it would help you to have a table of the C64 tokens handy).

End of the Lines

You may be wondering how a computer knows when it reaches the end of a Basic program. Remember

that link address I mentioned? Well, if the link address contains a double byte, then that marks the end of the program. As a matter of interest, if you want to know where the start and finish of a Basic program you can always peek into the following locations \$2D/2E and \$2B/2C. These two page locations are known as VARTAB and TEXTAB respectively. Going back to our example, if you look at Figure 2, you'll see that location \$0862 marks the end of our little demo program. If you count the number of bytes, you discover that this short test-line program takes up 97 bytes.

As you can see, Basic consumes memory very quickly. So what can we do to get the most of the available memory? As you may know, all the keywords can be abbreviated. In most cases this means typing the second letter only in shifted mode. Occasionally, you need to type the first two letters, then the third as shifted. The one exception to this rule is the PRINT statement: this can be abbreviated by the T key.

For example, "HELLO" is the

keyword is that although the screen editor on the fd is perhaps the best there is, it does limit us to only 80 characters per program line (that is, two screen lines). Therefore, by using shifted keywords we can squeeze more instructions onto any program line. The second way of gaining more memory is by putting more than one instruction on a line. The best way of demonstrating this is by example - Figure 3 is our screen line demo copied incorporating the two above tips. Figure 4 is the new method of storing it in memory.

Remember that in reality, all the keywords are abbreviated, but for clarity are shown as normal.

Now if you count up the number of bytes, you'll see that it comes to 75. So already we have made a saving of 24 bytes, and that's only on a very short program. Imagine the savings you could make on a large scale program!

Variable Lengths

Another area where we can save on

this point, I will assume that you know how to make up a variable, and the rules on what you can and cannot include in the name. Our main aim is to see how they are stored in memory.

All variables are stored immediately after the Basic program in memory, and are also stored in the order of creation. Strings, however, have two pointers. One is the address of the string, and the other is the string's length. Strings are also stored at the top of Basic memory, and work downwards. Variables are either algebraic subscripted. Simple variables use an overhead of seven bytes, made up as follows:-

The first two bytes hold the variable name. For strings, the next byte holds the length of the string, the next two its pointer in low/high format. The remaining two are unused. Integer uses bytes three and four for sign and value, with the remainder unused. Real uses byte three as its exponent, with bytes four to seven as its sign and mantissa. A function also uses seven bytes, the third and fourth point to the definition, the fifth and sixth point to its variable, and byte seven is initial value. Subscripted variables, unlike the simple ones, only require the associated values for storage. For example, string subscripts only require three plus the length. Integers only need two.

Earlier on, I talked of ways of saving yourself as much memory as possible by using abbreviated keywords and putting as many instructions on one line as possible. Well here's one or two hints on how to make your Basic program run a little quicker. The obvious one is that the less line numbers there are, the quicker the program will be. Secondly, ensure that all important variables are declared early on in the program. This will save look-up time. Third, try not to have thousands of GOTO's or GOSUB's - all that going and returning takes time. Finally, if you have lots of DATA, put it at the *finish* of your program. This will save time on each READ.

I hope that this article has helped you to understand just how Basic is stored. Remember that the best way of learning is through practice, so get yourself a machine code monitor, and start looking around. It will surprise you just how much knowledge you gain by poking and pecking around memory.

FIGURE 3

```
10 PEEK($2D), 1 PEEK($2E), 2 PRINT "HELLO",
  $2D/$2E, 3 PEEK($2B), PRINT $2B/$2C,
  20 GOTO $2A
```

FIGURE 4

HEX	HEXADECIMAL	INSTRUCTION	ADDRESS	OF
ADDR	REPRESENTED	IN MEMORY	HEX	HEX
0000	80 42 08 0A 08	RT 20 23	00	1,2,3
0001	31 78 20 27 23	SA 77 20	01	280,1,0
0002	81 50 08 31 17	SA 38 00	02	"HELLO",1,
0003	42 0A 08 45 46	RT 47 70	03	"HELLO",
0004	95 8A 40 50 80	RT 47 40	04	"HELLO",
0005	23 34 81 41 82	RT 44 50	05	"A,1,0"
0006	98 34 82 34 50	RT 45 48	06	"1,1,10"
0007	44 24 82 44 78	RT 45 40	07	"OF 200"
0008	47 17 08 40 08	LA 95 08	08	"0",0,0
0009	31 58 08 00 08	RT 95 08	09	"0",0,0

same as PRINT "HELLO". Likewise P followed by a shifted O is the same as PEEK (again the user guides give a full list of abbreviated keywords). So why does this help at all? Well the less number of lines you have in your program, the less number of bytes you take up. Remember, each line has an overhead of five bytes plus the line itself.

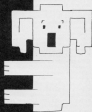
The reason for using shifted

memory is our variables. It's important to know what types there are, how they are made up, and most important of all, how they are stored in memory.

There are three types of variables allowed in Basic - string, integer and real. If you include function names, there are four. String variables have the dollar sign after the name, integer have the percent, and real have nothing. The default value is real. At

Prefab sprites

*Sprites will be sprouting out all over with this utility
from Down Under*



Most sprite editors operate on Bank 0 only but this one's different because it will edit anywhere in memory. Even the RAM under the VIC and SID ROMs are open for use, as well as the space underlying the Basic and Kernel ROMs. Normally, the only way to design sprites under VIC is to work in Bank 0 and then relocate them by programming.

In addition, each sprite can be flipped, reversed and copied but there's

one area that the sprite can't be placed. The area up to \$2000 is occupied by the program code, change this at your peril!



Once the listing has been typed in, the program can be run by the Basic RUN command or SYS 2067. This will show the sprite-scanning screen where the current sprite can be viewed or a memory scan can be executed by jumps of 16-sprite blocks or one by one.

After typing in the listing case it onto a spare disk or tape. When the program runs it will automatically save out the actual sprite editor so have a master tape or disk ready in the drive.

Commands

+ Increment sprite
- Decrement sprite
SHIFT + Increment by 16 sprites
SHIFT - Decrement by 16 sprites
M Select multicolour mode
H Select hi-res mode
R Reverse sprite
X X-flip (see ?)
Y Y-flip (see ?)
= X, and Y do a bitwise flip which can mix up the colours, this will equalise the result.
K Kill sprite (clear)
SHIFT U Scroll sprite up
SHIFT D Scroll sprite down
SHIFT L Scroll sprite left
SHIFT R Scroll sprite right
F1 Memorise sprite
F3 Copy memorised sprite to current sprite position
I Increment sprite colour

SHIFT 1 Decrement sprite colour
2 Increment multicolour 1
SHIFT 2 Decrement multicolour 1
3 Increment multicolour 2
SHIFT 3 Decrement multicolour 2
4 Increment background colour
SHIFT 4 Decrement background colour
5 Increment border colour
SHIFT 5 Decrement border colour
L Load — after which:
Press RETURN to enter the filename or SPACE to toggle between tape and disk before pressing RETURN. Enter the filename and press RETURN again to start the load.
S Save — after which:
Use + or - to select the

start address and press RETURN. Repeat the procedure for the end address. Use SPACE to toggle the save device. Press RETURN again and enter the filename followed by RETURN to complete the save.
V F7 F8 RETURN Toggle key repeat speed
Quit Enter or leaves editing screen
CRSR Moves cursor about within editing screen
+ Places a point in hi-res mode
1-3 Places colours 1-3 in multicolour mode
SPACE Unplaces a point

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Corruption



Any comedian in desperate need of a laugh has only to mention the magic word "yuppie" and the audience starts to fall about. But who are we to mock? Anyone who pours thousands of pounds into those ailing German car manufacturers, Porsche, or toy dog kennels masquerading as posh house flats in docklands deserves considerable sympathy. Nevertheless, there are considerable killings to be made in the city, in more ways than one.

Corruption is the latest adventure game from the pens of Magnetic Scrolls. After two excellent games, *The Pawn* and *Child of Thieves*, I did not enjoy their last effort *Amber*, very much and so I was interested to see whether that was going to be a one-off or whether the devline would continue.

The first thing that you notice is that the storyline is very different from anything that has gone before. The humour and quippy jokes have all disappeared. Everything here is deadly serious.

On the face of things, your future prospects couldn't be rosier. You have just been promoted to a full partnership in your company and can expect a corresponding increase in your lifestyle. The only thing wrong at the moment is a grotty office and a secretary who can pour milk with a single look.

Then everything starts to fall apart. You discover, or rather heavily suspect that your wife is having a love affair with your partner, although this is vehemently denied. The serious fraud squad are called in and you are accused of insider dealing, trafficking in drugs and sundry other offences. Basically, you have been set up, framed, and you have no idea why.

Whatever has done it to you, though, has done a pretty thorough job; and you soon discover that no-one is going to believe your excuses. You are going to have to prove your own innocence and that means that you will have to fight dirty. Very dirty indeed.

The key to your salvation is information. Everybody has their price or some little skeletons in their cupboard that can be used as a lever. All you have to do is discover where to apply the pressure. Useful commands here include asking or telling someone about something and following them to discover their daily routine.

Part of the packaging goes to show just what you're up against. Included is a cassette that, on one side, has a recording of your meeting with the boss just as he informs

you of your promotion. On the reverse side is the same conversation judiciously edited so that you have just given what amounts to a full confession.

The written part of the documentation comes on floppy pages (what else?), along with assorted pages containing useful telephone numbers of characters within the game and details of appointments. There are also Magnetic Scrolls' copyrighted hints - you can get a clue by typing in a whole series of seemingly random letters but whether the information obtained is useful or not is another matter. If you don't feel the need to cheat, at least you can't trample across the information accidentally.

The parser is by and large excellent although there are a few minor quirks, mainly involving getting to grips with some of the more complex commands. For example, if you open the cabinet in your office and examine it, you discover a lodge and a share certificate. If you now type 'get all', you are curtly informed that you don't see anything there even though you have just found it. You would need to type 'get all from the cabinet'.

Not every location is illustrated but those that do exist are of a reasonable quality, although I found it very difficult to be objective after having played the Amiga version. There are a number of graphic options available, from none at all, through small scene pictures, to full illustrations.

The biggest difference though between the 8 and 16 bit versions is in the speed of operation. The 64 version is very slow indeed, almost every command needing to access the disk drive and seeming to take forever and a day. Very frustrating indeed, when even my typing (two words per minute - in a good minute that is) works faster than the game!

Corruption makes a pleasant change from troll bashing and if you fancy an insider view into the seedy side of high finance, then this is a game for you. My only suspicion will come if Magnetic Scrolls suddenly get floated on the Stock Market.

GRH

Flashline:

Title: *Corruption*. **Supplier:** Magnetic Scrolls. **Platform:** *First Floor, 74 New Oxford Street, London WC1A 1PS. Tel: 01-360 8818. Price: £17.95.*



The 12 Days of Christmas

*On the twelfth
day of
Christmas,
My true love
gave to
me...*

Twelve Printers Printing...

Although the range of printers available to Commodore owners may at first seem limited to Commodore's worthy but uninspiring collection, a Commodore as an RS-232 interface opens up the possibility of linking through to virtually any machine which may take your fancy.

Serious applications, such as for wordprocessors, are no longer limited to typewriter-style, daisywheel printers because the quality of NLQ printers has improved on most makes of dot matrix machines. Laser printers still remain at luxury prices, but offer the highest quality possible for applications such as the GEMOS-based, GEMPublish DTP program.

The fastest, and strangest, machine is Precision's four-headed 4010 Peripheral Printer and the latest machine from Star Micros, the LC-10C, allows limited colour printing with a respectable range of typefaces. *Brother Computer Peripherals*; James & Brothers, Stapley Street, Audenshaw, Manchester M24 5JD

Canon Business Machines, Hadden House, Stafford Road, Croydon, Surrey

Commodore Business Machines UK, Commodore House, The Switchback, Gardner Road, Maidenhead, Berkshire SL6 7XA

Citrus Europe Ltd, Wellington House, 4-18 Cowley Road, Uxbridge, Middlesex UB8 2SN

Epson (UK) Ltd, Dorland House, 385 High Road, Wembley HA9 6UH

Intl. c/o Intec 1, Unit 3, Hazzards Wood, Wade Road, Basingstoke RG24 0NE

Micro Peripherals, Intec 2, Wade Road, Basingstoke, Hampshire, RG24 0NE

Precision Software Ltd, 6 Park Terrace, Wincanter Park, Surrey KT4 7JZ

Quaw, Quaw House, Park Way, Newbury, Berkshire RG13 1EE

Sealed Cosmos (UK) Ltd, 963M House, North Circular Road, Stonebridge Park, London NW10

Star Micros, Craven House, 40 Uxbridge Road, Ealing, London W3 2RS

Thomson Adde (UK) Ltd, OEM Special Products Division, 27 Goswell Road, London EC1

Eleven Music Makers...



Whether you use the in-built SID chip or a full-blown MIDI interface, the music capabilities of the C64/128 are broad enough for the most discerning ears. The enthusiast can experiment with keyboards, sound digitizers, drum machines or music-composing software and hardware. Always bear in mind that you only get what you pay for, and the quality that you require may cost a little more than you think.

The best bargain is still the Commodore Sound Expander, which offers affordable FM synthesis on a quality keyboard, with up to 34 preset voices which can be expanded upon by using the add-on FM Composer/Editor package.

Since its arrival, Sams has made

quite an impact on the Commodore 128 MIDI scene (was there life in MIDI before Sonnet?). With interfaces and software, what more could you want?

Commodore Sound Expander £99.99: Music Sales Ltd, 8-9 Frith Street, London, W1V 5TZ.

Music Maker II 64/Music Maker 128 £19.99/24.99: Music Sales Ltd, 8-9 Frith Street, London W1V 5TZ.

Sonnet MIDI Interface
The Advanced Music System £29.95: Rainbird Software, First Floor, New Oxford Street, London

Microvax Sampler £29.95: Supersoft, Winchester House, Canning Road, Walthamstow, Middlesex HA5 7SL.

Datal Sampler £49.99: Datal Electronics, Units 8/9, Dewsbury Road, Fenton Industrial Estate, Fenton, Stoke-on-Trent

Super Sequencer by Sonnet

Rhythm King £19.95: Supersoft.

Com-Draw £29.99: Datal Electronics.

MIDI Interface C64 £29.99: ElectroMusic Research, 14 Mount

Close, Wickford, Essex SS11 8HG.

MIDI Interface £29.99: Datal

Electronics

Ten Games for Playing...



Any base for a great games collection should include all of the following:

Witch-hiker's Guide to the Galaxy -

Infocom/Multiagenic

Exilean - Horwar

Snake Fleet - Electronic Arts

Impossible Mission - US Gold

Olympic IV - Origin/Microprose

Mercurian - Navagra

Swain's - Flechtel

Gamester - US Gold

Last Ninja - System 3/Multiagenic

Snake Fighter - Microprose

AMX Mouse £69.95 - Advanced Memory System
Datal Lightpen (supplied with Blazing Panther) £24.99 - Datal Electronics

Eight Books for Reading...



Although many books have been written for the Commodore C64 and C128, many are now difficult to find or are simply out of print. To help you we have included all of the information we could find, in the format: title - author - publisher - ISBN - price.

The Commodore 64 Programmer's Reference Guide - Commodore Business Machines/Sams & Co Inc - ISBN 0-672-20006-3

Advanced Commodore 64 Graphics and Sound - Nick Humphrey - Collins - ISBN 0-08-303099-4 - £9.95

Commodore 64 Music - Ian Waugh - Sunburst Books - ISBN 0-946408-78-5 - £6.95

Computer's FIC-28 and Commodore 64 Tool Kit: Kernel - Dan Heeb - Computer Publications Inc. - ISBN 0-942388-13-7 - £13.95

Mastering Machine Code on your Commodore 64 - Mark Greenfield - Interface Publications - ISBN 0-907563-69-4 - £7.95

The Amstrucator: Overview - A.K. Dewdney - W.H. Freeman & Co - ISBN 0-7167-1939-4 - £10.95

Basic 128 Training Guide - Frank Kampor - Abacus Software - ISBN 0-916428-64-3

The Anatomy of the Commodore 64 - Anglohausen, Becker, English, Gents - Abacus Software - ISBN 0-916428-69-7

Nine Picture Painters...



Graphics on Commodore computers can only be fully exploited through a good arts package with first class aids.

Blazing Panther £12.99 - Datal Electronics

The Advanced OCP-Art Studio £24.99 - Rainbird

The Image System £14.95 - CRL

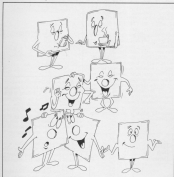
Artist 64 £29.95 - Wignone

ColorMaster (plus free lightpen) £19.95 - Trojan

Neo Mouse £24.95 - Stack Computer Products

Datal Mouse £24.99 - Datal Electronics

Seven Disk Comparisons...



A part from Trilogic's *Datasette Director* and Mills Associates' *Load-it* kit, there are very few aids for cassette users so it's the disk users that benefit from this section.

Drive *Doctor* from Trilogic has established itself as one of the easiest to use disk alignment kits which has the advantage of having the test programs on tape and only costs £14.99.

1571 *Fix ROM* cures the failings of the C128D-disk drive - £24.95 from Financial Systems Software Ltd. Dolphin *DOS* is tricky to install and requires a certain amount of desoldering of the C64 circuit board but it will worth the effort. Evenham Micros sell the kits for £99.95.

The *Monitor* (£14.99) from Sanscom is a cheap way to double your disk capacity. This handy tool punches a notch which renders the reverse side of the disk usable. Microprocessors are the UK distributors of Sanscom products.

No disk drive owner should be without our sister magazine, *Commodore Disk User*, which offers a disk of useful utilities, games and tutorial programs with programming lessons and games reviews in the

magazine itself. *CDU* is issued bi-monthly at the bargain price of £2.90.

Disks need to be protected from dust and stored tidily. There are many disk boxes on the market for around a tenner but the super deluxe version is Iomega's £39.99 lockable box, which has a built-in burglar alarm!

Series disk users will find the book *The Anatomy of the 1541 Disk Drive*, by Abacus Software, an invaluable aid.

Six Interfaces...



Interfaces fall into two broad categories: Centronics and RS232. Centronics interfaces are generally preferred because the driver program and hardware is contained in a separate box and therefore doesn't take up any of the computer's memory. An extra benefit is that these units plug into the serial port, the normal printer port on the C64/128.

Brain Boxes of Liverpool produce one of the cheapest printer connectors available. The kit comprises a memory-resident Centronics driver for £3.99 and a connecting lead (£19.95) which plugs into the serial port. Brain Boxes own RS232 connector and software costs £49.95.

Precision Software's *Super Centronics* interface is a low-cost device with a few advanced features for £24.95.

Driver One is more expensive but it does contain a 16K buffer and 30 special commands for formatting printers and accessing special printer facilities.

At £29.99, the York Electronics Research *RS232* interface is not as sophisticated as that of *Brain Boxes* but it still performs well and comes with its own driver software.

The *Exor Super Graphic Gold* is the ultimate interface. It has 128 of RAM, eight switchable operating modes, 20 secondary addresses, 52 printer settings, four internal screen dumps, four built-in fonts, and so on. In fact, everything you could need but a confusing unit for the newcomer to printing.

Five Car-trid-ges...



Cartridges are usually considered to be the computer's piracy kit but

they can do more than just blag. They all contain disk turbos and the speed is expressed as a multiple of the normal loading time which is taken as 1s or one times normal.

The facilities of *Quadrisked* (Evidham Micros) are reflected by its low price of £19.95. What it does, it does well, but it is basically a fast disk (2s) utility cartridge.

Frontier Machines, also from Evidham, costs more (£28.95) but it actually contains two discrete fast disk operating systems (one 8s and the other 15s faster but using non-standard disk storage) and a tape turbo which increases tape loading to professional standards.

The *Final Cartridge III* is a quickly unit (£8.99 from Data) which is conceptually appealing but not fully thought through. It does, however, have an excellent program compressor and extended Basic and reaches disk speeds approaching 15s.

Triplex's Express cartridge (£29.99) has the benefit of being RAM based so that updates can be acquired cheaply. This does have the disadvantage that it has to be re-booted each time the computer is switched on, but it does have a turbo which reaches speeds equivalent to Action Replay and every conceivable facility except for an extended Basic and drive memory monitor.

Action Replay Professional II has everything in ROM: a 35s turbo called Warp 25, a few extended Basic commands and a monitor which operates on the disk drive's memory as well as the computer's. At £34.99 it offers very good value for money.

Four Assemblers...



An assembler is an essential aid for machine code programmers. It

even simplifies the mnemonic monitor style of programming by allowing labels to be allocated to often-used memory locations. The problem is finding any assemblers in the shops.

Micro Assembler from Superdisk is really for newcomers to the assembly arena but the £57.50 price tag is a little heavy, though this hasn't dissuaded many people from buying this very useful cartridge.

York Electronic Research's £50 ASM is much more the price which a beginner would want to pay, but this does mean sacrificing a few of the more advanced facilities.

Merbs II is an excellent choice, if only by virtue of being the only assembler for the C128. It is available from Financial Systems Software.

Speedy Assembler is our own assembler which is an absolute rip at £5.00.

Three Disk Drives...



If you want compatibility stick to the 1541 or 1570 is the general advice that many computer salesmen would give, but there are other reliable options.

The *Commodore 1581* is a late-comer to the field and a very odd beast it is, too. It uses 3.5 inch disks which have a capacity almost five times that of a single sided 3.5 disk. It makes a very useful second drive for those who need to store vast amounts of data.

The *Orionic Drive* was formerly also known as the *Excelsiorator*. It is a compact unit which is fully compatible with the 1541 and can be bought with GDSII for £129.99 from Evidham Micros.

The *Blue Chip* is Data's sturdy little drive which is sturdy and seems to be identical to the 1541C in every respect apart from styling. If it's style you want, this is for you.

Two Graphics Pads...



Most people use joysticks or mice for designing hi-res screens but pads can help. If a drawing is laid over the pad, it can be traced onto the screen using a small stylus. You won't get a perfect picture this way and it will need to be tidied up using a joystick or mouse. What it does do, however, is to help the non-artist to tackle proportion and perspective to give professional results.

Koala Pad virtually stands alone in this field. Most software is made to be compatible with it but availability is not all it should be. If you can find one, grab it quickly.

The *Scancom Graphics Tablet* lacks compatibility with the *Koala* so it is not so well supported. Its one advantage is that it can be easily obtained through Microprose.

And an Order for All This Year's YCs...



The best way to decide what you want next Christmas is to read the only magazine which specialises in reviews and programming techniques. As your skills grow, so do your needs and we are here to help you make your next choice a good one. A subscription only costs about the same as a good adventure but it will last you longer and take you through the changing landscape of the world of *Commodore*.

Anna O'Ninan

The #1 Column Color Paint System For Your C128 Computer.



Press A Key To Continue!

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Basic 8

Basic 8 is a Basic Extension which builds on, from the existentially named Watrasoft. The name is clear once you know that this is largely a couple of guys named Louis R. Walker and David P. Darns (hey what? - I thought that was Greavack's name in *The Big Store*).

No less than 55 new commands are added to the C128's repertoire by the package, some of which are more advanced versions of the C128's existing commands. The authors have conceived it as a graphics-orientated language, and certainly commands in the area are lavish.

This is the first language I've seen for the 64/128 that defines graphics pixels as existing in 3-D space. Although the majority of shapes definable are themselves 3-D, this means that they can be rotated into and out of the screen. Both perspective and parallel viewing of the objects is possible.

Besides this, Basic 8 does have a number of solid 3-D commands. These are based on algorithms developed by Richard Ryzanek for the C64, and they work very effectively.

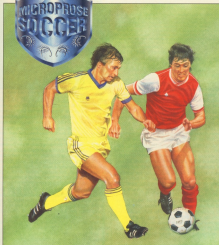
The commands are very pretty for all that. You can draw spheres, cylinders, cones and toroids in half-tones of random shading, of any aspect, so this at least makes Basic 8 unique.

These are really just special effects, though. There is more meat here than that. The package also allows you to define multiple windows to put text and graphics in. Text can be in any

font you choose, as long as you've got it on disk, and you can set parameters to alter the height, style and so on of the characters. A special form of the character command, the logo structure, allows you to set up complex text data structures such as one command, and implement these as one command.

The package contains a host of other features, such as full mouse support. You can sample these for yourself quickly, since the package also contains Basic Paint, a very effective drawing package based on icons. Which is effective, if a little slow. But what can you expect - it's written in Basic.

The best thing of all is that unlike many other packages, the developers don't mind other people using the Basic 8 package to set up their own run-time packages. This makes it definitely a worthwhile package for any one thinking of developing their own graphics software.



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The Games:

Following the release of *Winter Edition* in the summer, *Apex* plans to complete its unique double by releasing *Summer Edition* in the winter! But this is more than just another in the "Games" series - it has 3D action and a brand new style of presentation.

It was also the official game of the US Olympic team in Seoul, so it's hardly surprising that all of the events included are either currently held by Americans, or have been the source of past US Olympic glory. These are eight events in all, and up to eight players, representing any of 24 nations, can compete simultaneously for gold, silver and bronze medals.

After an opening ceremony showing scenes of Seoul, the screen shows a top-down view of the Olympic village, and then the games begin. The first event is diving, giving you the chance to mimic the exploits, if not the injuries, of American medal winner Greg Louganis. You have three chances to impress the judges with somersaults, pikes and twists, and a single splash can destroy your chances of a medal.

Velodrome cycling is that curious sport where riders crawl around the track at a snailpace before sprinting for the finish. If you've ever wondered why they do this, try sprinting from the start and you'll collapse in a heap by the end of the first lap. The secret lies in being pulled along by the suction of air caused by another bike, allowing you to conserve your pedal power for the finish. In the split



screen display, a top-down view of the track plots each rider's position, but two 3D close-ups let you see the action.

Next you go into the gym for the uneven bars and the rings. Both are demanding and exhilarating technical events, where the slightest slip can send you plummeting to the ground and out of the competition. The two events are superbly displayed in 3D graphics, but are remarkably different. In the uneven bars, twists and turns swap you from bar to bar at an alarming pace, while the rings require strength to hold and maintain copping positions.

Hammer throwing demands strength and timing as you swirl the hammer around your head, then spin across the circle before launching it into the field. Once the hammer has been released, the display moves to an angle over the field and you can see the hammer soaring towards you, perhaps for a new world record.

Next it's Ed Moses time, with the hurdles waiting to trip the unwary. Here it's the fastest time that matters, so all you have to do is get down the track as quickly as possible, negotiating the hurdles as best you can. Obviously tripping slows you down, but as long as you don't actually fall you'll stay on your feet and in the medals.

The pole vault is a tricky technical event in which you must bring together a spring to the bar, the lift with the pole and then turning over the bar. If it all comes together, fireworks go off and your joystick athlete celebrates with a Daley Thompson-style back somersault.

Finally, Archery demands different skills - judging the amount you pull back on the bow, aiming at the target and waiting for the wind to drop before you fire. Unfortunately, a 90 second clock piles on the pressure, but there's enough time to fire three arrows if you keep cool.

The Games: *Summer Edition* ends with a closing ceremony complete with winning positions and demands from your players for just one more game. Undesirably, it's the 3D graphics that literally add a new dimension to a tried and tested winning formula.

T H



Touchline:

Title: The Games: Summer Edition. Supplier: Apex (US Gold). Data 2/3 Bedford, Bedford Way, Birmingham B6 7AG. Tel: 021 358 1388. Machine: C64/128. Price: £14.95.

Summer Edition

I.C.P.U.G

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Using tapes can be hard work. Make your life easier with this utility which sets up a loading menu at the start of your tapes

By
Terry Wilks

Plus/4 Tape Auto-run

The tape drive systems of home microcomputers such as the Commodore 16 and Plus 4 are more simple and far less versatile than the large complex drives of mainframe computers. They do, however, retain the benefit of being an inexpensive program storage medium. Microcomputers, of course, have progressed considerably in the past ten years, but one of the annoying features of their use is the lack of ability to load a program from tape that will automatically start at the completion of the loading operation.

Basic programs are no major problem. They only require the entry of RUN plus RETURN from the keyboard. Machine language programs are another matter. Most of the time these programs will require their own peculiar start address to be entered. Good housekeeping techniques do reduce the chances of losing this address, but then how many of us keep a perfect house? There will be many occasions that will require a time-consuming search through old magazines to find that start address.

The program presented in this article overcomes this limitation in the tape operating system and allows both Basic and machine language programs to self start. This overcomes the requirements imposed on start addresses. The Basic portion of the autostart program is fairly long, however fairly extensive checks of the utilisation of the computer's RAM space are carried out to ensure that no program hangs up over.

The program also allows address data required for the autostart program to be entered in either decimal or hexadecimal format. During entry of this data, it will be necessary to specify data type. One of the problems that can occur with this type of entry system is neglecting to specify data type - should this occur the user will be

flagged with a double question mark at the beginning of the line following the input line. Do not try to enter data type on this line, simply press Return. A prompt will then appear requesting data type, and once this prompt is answered the program will continue uninterrupted.

Be sure to Save the program before running as it will destroy the Basic portion of itself as soon as the required information is entered. I have not incorporated a verifying facility, so be

sure that your own program is saved by the normal method first. To load an autostart saved program, simply type LOAD or LOAD"FILENAME". All of the necessary Zero Page pointers will be taken care of by the autostart portion of the saved program.

Getting it on

The program is mostly a Basic listing with a machine code loader section. For help buying it in, see our Listing page.

*If you've considered
writing for us,
but haven't got a
wordprocessor,
here's a little something
that may help*

By Darren Bowden



Dazpro

Although Dazpro is a very simple text processor, it should meet many of your needs. Simple it may be, but it will still allow you to do such useful things as centering and justifying and adding headers and footers. Just the thing to get you started on that career as a novelist.

Operating Instructions

Dazpro is always entered, once you have typed in the Basic loader, by entering SYS 3959. It's then just a matter of typing in text using the usual Basic editing functions. Dazpro colours are changed as follows:

Change header colour: CTRL/I

Change screen colour: CTRL/J

Change text colour: CTRL/K

All other features are implemented by entering Command Mode, which you do by pressing the F1 key:

Set left margin: F1+L - You must then enter left margin value, which

must be less than the right. Value should be two digits with leading zero if necessary, for example 03. The figure must also be between 0 and 79 inclusive.

Set right margin: F1+R - Constraints are the same as when setting left margin. Obviously the setting must be greater than that for the left margin.

Insert line: F1+INST at cursor position.

Delete line: F1+DEL at cursor position.

Justification on/off: F1+J - This is a toggle for left justification of text. A 'J' will appear on the top left of the screen to show that this is on.

Right alignment on/off: F1+A - Toggle for right alignment of text. An 'A' at top right will show that this is on.

Centering on/off: F1+C - A 'C' at top right will show when this is on.

Key-beep on/off: F1+B - 'B' at top right shows when this is on.

Save file (tape only): F1+S - You will be asked to enter a filename up to ten characters in length.

Load file (tape only): F1+L - You will be asked to enter a filename up to ten characters in length.

Print file: F1+P - A Commodore printer, or an interface which emulates one will be needed for this.

Go back: F1+ - Moves the cursor to the end of the previous line.

Clear memory: F1+RUN/STOP - clears all text, reverts margins to default values and resets all text formatting.

Note that after any I/O operation, such as saving, loading and printing, all margin values will be reset to default and the cursor will be moved. Default values for margins are 03 left and 73 right. All text formatting features will be disabled.

Dazpro is supplied in the form of a Basic listing - please refer to our Listings page for further help, for further help.

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Final Assault

From this game's title, I must confess that I was expecting some sort of SAS-style shoot out. That it would prove to be a mountainering simulation came as a great surprise. Climbing large chunks of rock sticking out of the ground was not a sport that I had ever considered as being suitable for conversion to a computer game. Nevertheless, that is what Infogrames in conjunction with Epyx have managed to come up with.

Most of the top peaks in Europe are available for you to test your skill on - Mont Blanc, Jungfrau, the Eiger and the Matterhorn. Names to make any budding Chris Bonington quake in his crampers.

The easy part comes when you sit back in your comfy armchair, deciding which of the routes you are going to attempt. There are six grades, easy, intermediate and who's a little show-off then. For real mountaineers, up to three trails can be attempted one after the other. As you select each route, you are shown its name, elevation in metres and estimated time for completion of the climb - assuming that you don't fall off too often.

Next comes the important part - deciding what you are going to take with you. Your rucksack can hold up to 25kg of gear. Actually, it can take more but every extra item that you pack increases the likelihood of you moving in the opposite direction to that which you would like to go.

The items to choose from are many and varied. Some, such as ropes and hammers, are obviously essential. There are a whole range of these tools including chocks, jummers and vanishes. Fortunately, the instructions include a handy glossary so you know what it is you are lugging about with you.

Then you have to keep warm, so there is a range of clothing and sleeping equipment to include - snowsuits, mittens, tents, stove goggles and the like. Food and drink must also be carefully planned. Some foods are obviously better than others for giving maximum energy for minimum space taken up. You will also need a cooker, plates and some sort of tin opener.

The last group of items are the luxuries which you can pick if there any space left over. A bottle of champagne might be a good way of celebrating but who in their right mind is going to want alcohol? Knowing how it stings

at sea-level, can you imagine what it is going to do to your face at 12,000 metres? Still, the game was written in France and we all know what a strange lot they are. (All this is very chcolo, coming from someone whose face hasn't been near a razor for the past ten years - ed).

All that remains to do now is to decide what time of day you are leaving and whether it's summer or winter.

Once the journey has started, there are three main types of terrain for you to overcome. The easy one is hiking when the ground is flat. A quick wobble of the joystick gets you walking and you only have to remember to jump over the crevasses. A similar idea is used for climbing ice cliffs. After putting on your crampons, you need to build up a rhythm of digging in your ice, securing one foot, pulling yourself up and setting the second foot.

By far the most interesting part of the game is the rock climbing. Each limb has to be moved separately as you search out the best hand and toe holds. Grips can range from secure to tenuous to non-existent. Whilst three solid holds are advisable, allowing you to move the fourth limb safely, this is not always possible. This means you are faced with the job of not always moving to the correct spot and you have to work quickly as well to secure a safer hold on things.

The best line to take is not necessarily straight up. You will have to traverse, or even move down, to find better holds. You must also take the necessary evasive action if rocks start to fall on top of you. Should the going get too tough, you can always use your rope to help you out but remember to pack a jummer so that it can be recovered again.

I must confess to going into this review expecting to be bored silly. Instead, I found Final Assault to be both interesting and challenging. Presentation and control of the game are above average and it really does make it pleasant to play something original for a change!

Gordon Hamlett

Fourthly:

Title: Final Assault. **Supplier:** Epyx/US Gold. **Discs:** 2 & 3. **Refined Way, Medford, Birmingham B6 7AJ, Tel: 021 354 1288. Price:** £14.99 (Disk), £9.99 (Cartridge)



Collectors' Items

Why not fill your Christmas stocking with a few legends?

Compilations are the hi-tech equivalent of stocking fillers and by the look of things, this year's footware should be bulging with software.

The big names seem to be bringing out real crackers to woo you away from the Christmas pudding. All this meat and not a turkey in sight! *BeastFul*.

With US Gold, *Gloran*, *Elite*, *Gremlin* and *Bras Jolly* all vying for a slice of the action, how will anyone find time to buy the full-price new releases? Okay, so the compilation games aren't brand spanking new, but they do represent excellent value for money. What better way to fill in gaps in your collection of games or to get a new one off to a flying start?

US Gold

US Gold are past masters of the art of compilation and have released four packages guaranteed to get your mouth watering.

The first and largest package is modestly entitled *Whisky in the Making* and contains 13 of their best-selling titles which have been released over the past four years.

BeastFul and its sequel, unoriginally called *BeastFul II*, offered Second World War shoot-em-up action as you try to break down the enemy's defenses, using a combination of guns and grenades. If driving fast vehicles is more to your taste, then how about *Spideebug* which combines driving skills with the ability to shoot straight, or *Sagewynde*, the motorbike simulation from Epyx.

Controversy raised its ugly head with *Raid over Moscow*, when certain elements of the media objected to the name. The game itself is a futuristic shoot-em-up, even if you are left in no doubt as to who are the badies.

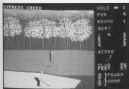
If close range combat is more to your taste, then *King Fu Master* gives you the chance to kick and punch your way past hordes of guards, dragons and the like. *Bras Jolly* combines the martial arts theme but combines the beat-em-up elements with a platform game scenario.

Further platform games in the package are *Goonies*, based on Steven Spielberg's film and *Impossibly Amazing*, one of the best games of all time, if only for the incredible speech effects - "Destroy him my robots".

If strategy is more to your liking, have a go at *Defenders*. First you have to fly a helicopter deep behind enemy lines before launching a one-man raid on the enemy's home base.

For the sports-minded amongst you, *Leadshoard* is still the best golf simulation around (see below for more details). *World Games* gives you the chance to try your hand at tae-kwon-do, roller-skating, chess-playing and other diverse pursuits.

The last batch of games are all conversions from arcade classics. Is there anyone, anywhere who has not heard of *Demolition*? There is! Well in that case, the game involves exploring and fighting your way through as many dangerous levels as possible using one of four different characters.



Leadshoard



Gold, Silver, Bronze



Rolling Thunder

Likewise, is there anyone who has ever watched the cartoon who has not wished that Wile E. Coyote would catch that awful Roadrunner just once?

Finally, there is *Express Route*, a Western involving plenty of shooting and leaping from train to train and all the other typical things cowboys do.

History in the Making costs £24.99.

At the time of writing, the Olympics are in full swing and as usual, there is the tendency to play the armchair expert. If your athletic prowess extends no further than the armchair (all my exercise stopped when I got a watch that didn't need winding) then perhaps *Gold, Silver, Bronze* is the package for you. Comprising the first three multi-sport titles from Egypt - *Summer Games I and II* plus *Winter Games* - you get the chance to make an utter fool of yourself in the privacy of your own home in no less than 25 different events.

The Games range from traditional track and field events such as pole vaulting, 100 metres, high jump and javelin, through the more unusual sports of swimming, diving, shooting, cycling, gymnastics and show jumping, to such winter wonders as biathlon, bobsleigh, ski-jumping and figure skating. *Winter Games* has claimed more bilibili in our household than any other game, before or since.

If you have not already seen these games, they really are superb, especially if you get a crowd of you playing at the same time. *Gold, Silver, Bronze* costs £14.99 (cass) or £17.99 (disk).

For anyone fancying themselves as the next Sandy Lyle or Nick Faldo, this next compilation is indispensable. Even if you are not exactly keen on golf, this collection of games based on *Landerboard* is undoubtedly one of the best sports simulation programs written to date.

Entitled *Par 4*, the package consists of the original game plus the *Powerment*, *Erratic* and *World Class* editions. As well as offering a wide range of courses, these sets offer enhanced graphics and tougher gameplay options should you find that your touch with the pitching wedge is getting too good.

For anyone who has not seen the game before, you must select your club for each shot and then judge how much power to use and whether to cut or hook or slice your shot. These last two variables are decided by judging when to stop a sliding bar display.

All the normal features of golf are present - bunkers, water hazards, cross winds, trees and sloping greens. There are three different skill levels and up to four people can

play simultaneously. At only £24.99 for the cassette version, this has got to be a great bargain.

The final compilation is entitled *Glenn* and features five of US Gold's more recent releases. *Glenn* is the sequel to the game that spawned a thousand clones and is packed with over one hundred new levels and many new features. There are many traps to avoid, monsters to kill, secret rooms to be discovered and, of course, bags of treasure to be picked up.

Rolling Thunder is another arcade conversion. You are part of an undercover police organisation trying to infiltrate and expose a secret organisation plotting to conquer the world. This is a race against time to free your allies who are being held hostage.

Should you feel too cool and laid back to waste energy on some of the sports simulations mentioned above, how about *California Games*? A gentle game of freeride, surf riding and skateboarding are amongst the events on offer here.

Skateboarding is also the name of the game in *TSP*. The name comes from the ultimate manoeuvre available to you - two complete revolutions in mid-air. Before you get to be that clever, you may need to hone your skills in one of the many skate parks where you can practice either freestyle or in competition.

The final game was one of the biggest hits in the arcades during the course of last year. In an open-top sports car with your best girl by your side, choose your course and try to complete the various stages of *Glenn* within the time limit in order to progress on to the next one. Quick changes of gear are essential if you are to avoid the obstacles both on and off the winding, undulating road.

Glenn will appear on the new *Worldwaster* label in time for Christmas, but the price has yet to be announced.

Ocean

Ocean produced one of the best compilations of last year with *Game, Set and Match* and so it comes as no surprise that *Game, Set and Match II* is on its way. Details are still vague but it will probably be another 20 ocean pack and will include *Basket Master*, *March Day II*, *Track and Field*, *Nick Faldo's Golf*, *San Antonio's Cricket*, *Steve Davis Snooker*, *Super Hang-on*, *Super Bowl* and *Winter Olympics*.

Another Ocean offering is still to get a name but the

impressive line up is known which features eight games including six number ones. So if you're looking for a big value pack and you only have one or perhaps two of the following, then chalk this up as a must for Christmas as it includes *Combat School*, *Gryzor*, *Platoon*, *Last Ninja*, *Predator*, *Rambo*, *Target Renegade* and *Barbarian*.

Elite

Elite is famous for it's Hitpak series of compilations and produced the first one containing only its own games in the form of Elite Volume 1.

Regular readers of *Your Commodore* will know that whenever a software house puts Volume 1 after a title you know there's a Volume 2 following shortly. Just to keep you guessing Elite has called the compilation *Frank Bruno's Big Box*, which contains 10 games including *Frank Bruno's Boxing* (surprise, surprise), *Commando*, *Ghosts and Goblins*, *Rocky Duo*, *Air Wolf* and *Scorpio*.

Five and Thirteen is the imaginative name for a five game pack containing fighting action from *Dhandercock*, *Dragon's Lair* and *Star Warriors*, and a duo of racing games *Enduro Racer* and *Buggy Boy*.

Griffin Graphics

Griffin Graphics is well known for it's big-value compilations and was one of the first to enter the arena

with it's Star Games range and, more recently, *30 Great Games* (challenged up another first by including so many hits in one box). Griffin has three more compilations lined up for this Christmas.

For Mega Games Fishes 1 is the first from the relaunched Star Games series and packs *Cyberworld*, *Defender*, *Four De Force*, *Mark II*, *Blind Bombers*, *Hercules*, *Korcorator*, *Tron*, *Blood Valley* and *Masters of the Universe* into a single box.

Fighter Ace is a six game pack and the sequel to the long-fa compilation *Rambo Ace*. Inside, high flyers will find *Advanced Tactical Fighter*, *Strike Force Marine*, *Spitfire 40*, *ACE*, *Tomahawk* and *Air Traffic Control* loaded and ready for take off.

Similarly, you could travel into the future with *Space Ace* and tackle *Proton Strikes Back*, *Zynaps*, *Excels*, *Starblaster*, *Cyberworld*, *Tron* and *Erivon* in a seven game pack.

Beau Jolly

Finally, look out for the latest releases from Beau Jolly. It's a company that doesn't get its fair share of publicity or magazine coverage but works hard in the background to compile formidable compilations.

It's current release is aptly named *Supreme Challenge* as it packs *Elite*, *Sentinel*, *Trois*, *ACE II* and *Starblaster* in the same box for only £12.95 (cash) or £16.95 (slak).

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UDG Compressor

by Damien Marsh

Make way for more user-defined characters by wiping out the duplicates

Anyone who writes games or programs involving graphics will know the simple technique of placing user-defined characters in a grid to make a larger picture. One problem with this technique is that duplicate characters are often formed. This really becomes a problem when you have filled your 256 characters already and wish to add more. The Basic program related with this article will search your character set for duplicate characters and then, upon your direction, delete them in one of two ways.

Getting it all in

The program should be typed in using the Syntax Checker program and then saved to disk or cassette. Thereafter, whenever you have finished creating a character set or have filled up the 256 characters and wish to add more, load your character set, type NEW and then load the UDG Compressor program and run it.

Even if you believe that your set has no duplicates, you should still run the compressor as it because it often picks up duplicates that the human eye misses. When tested on a copy of the Commodore ROM character set, it found ten duplicates.

Using the program

When running the program, it first asks you where the character set is situated in memory (remember the character set should be loaded before the Compressor). It cannot be stored in any area of shadow RAM below 6144 (31980) as the program won't recognize it.

The program then asks for the last character in the set. Once you enter this, the search will begin for duplicated characters. This search may take quite a while, as every character

in your set must be checked against almost all of the others.

Once the search is complete, the program will have formulated a table of duplicates. This table tells you which characters are duplicates of any of the others and could therefore be removed. If, for example, our character set contains eight characters (two to seven) which form two grids to make up the letters O and Q as shown in Diag 1.



The chances are that characters four, five and six will be duplicates of one, one and two, respectively. A table of duplicates would look like Table 1.

CHARACTER NUMBER	IS IDENTICAL TO
0	****
1	****
2	****
3	****
4	0
5	1
6	2
7	****

Table 1 — Duplicate table for Diag 1

A character with five stars in the right-hand column is an original whilst the others are duplicates of the character whose number is displayed. There is option to list this table to the screen or printer. When listing to the screen, a key must be pressed after each screenful of information.

You may now quit the program, delete the duplicate characters, and, if necessary, compress the set. If you choose to delete the duplicate characters, you will be asked for a table with which to fill them. After the operation is finished, a conversion table will have been created which gives all the information that you need to convert the characters in your old character set to their respective characters in the new set. A conversion table for our example characters would look like Table 2.

OLD CHARACTER	NEW CHARACTER
0	0
1	1
2	2
3	3
4	0
5	1
6	2
7	1

Table 2 — Conversion table



Make sure you always keep a copy of the characters used to make up your grids when using this program. First draw a grid for each character block as in Diag 2(a).

0	1	4	5
2	3	6	7

Diag 2(a) Original character grid 2(a)

Then draw another grid set ready to put the new characters in. Look down the columns on the left for the old character number and read across to find it's new value in the right-hand column. Now write this new number in the correct place on the blank grid. Repeat this process until all your grids are filled. Our example character grids should now look like Diag 2(b).

0	1	0	1
2	3	2	7

Diag 2(b) Deleted character grid 2(b)

As you can see, characters four, five and six are now unused. If you were now to load the new set on your character editor, you would see that the deleted characters are now filled with the code you entered earlier in

the Compressor program. You could now fill those characters with something else without causing damage to your grids.

Using this method gives you free characters scattered throughout your character set. Instead of choosing to delete the duplicate characters, you may choose to remove them and compress the set. This method compresses the original characters down over the unwanted duplicates, leaving all of the blank characters at the end of the set. If you have a large set, this process may take a few minutes.

Once again you have the option of using a conversion table to the screen or printer. Use this table in the same way you would have if you had just deleted the characters without compressing the set. You may notice, in the table created by this process, that some of the original character's numbers change as well. Using this method on our example set would give us Table 3.

Table 3 - Conversion table after compression

OLD CHARSET	NEW CHARSET
0	0
1	1
2	2
3	3
4	1
5	2
6	3
7	4

The character grids for the new character set would look like Diag 2(c)

0	1	0	1
2	3	2	4

Diag 2(c) Compressed character grid 2(c)

Whichever method you use, it is very important that you have a hard copy of the conversion table. If you do not own a printer, you should list this table to the screen and copy it by hand. This may seem like a lot of work but it is worth it in the long run.

The serious games programmer or graphics artist will find this utility very useful indeed. To test the program, I created a character set comprising of the letters A to G, each in a three by three grid. The original set used over sixty characters but it compressed down to less than thirty.

Final note

There may be cases where you might deliberately wish to retain a set of duplicates such as the letter O with the number zero. In this case, you will have to change one of those before using UDC Compressor and remember to change it back afterwards.



Mailbag

We give you a chance to express your views on just about everything from the world of Commodore.

Dear Editor,

I was interested in the Litaney No. 12 for the C64 in the November 1988 Four Commodore. The Illegal Quantity Error is not very helpful as your Litaney pointed out, but the article didn't go far enough.

As soon as the illegal in-and-out message appears on the screen type, in direct mode, the following:

```
PRINT FREE (63)/PEEK (84) *236
```

The C64 will now display the line number from which the last DATA item was read. List the offending line, correct it, and the RUN the program again.

When entering listings, I always find it beneficial to insert a line within the FOR...NEXT loop that reads the DATA such as:

```
PRINT "LINE NUMBER  
"chr(190); "is OK"
```

Where *n* is the number of the first line of DATA, 1 is the FOR/NEXT variable and the DATA lines have *n* items on them. Alter the value to suit the program that you are entering.

Now when you RUN the program you can see which lines have been entered correctly.

Incidentally I owned and used a knitting machine for years before I purchased my first home computer, a Vic 20 back in 1982. Like Mr Norman Stone, whose letter appeared in the October issue of the magazine, I also thought that it would be a good idea to formulate a knitting pattern so I did just that. However, I found that I never used the thing—all my previous knitting patterns were in my pattern book self-writer, and I referred to that when knitting something.

Mr Stone should forget computer knitting patterns and splash out on the Mary Weaver book of Machine Knitting Technology and Patterns. There is a wealth of information for machine knitters and there is also a constitution book for ribbers.

I sincerely hope that the info concerning the Illegal Whosis helps those readers who have not come across this before.

R T Goodwin, Newcastle.

Thank you for your tip about the Illegal Quantity Error message. However, as with our Litaney, you don't quite go far enough. C66, Plus/4 and C128 owners may like to know that the same formula will work for their own machines. For the C18 and Plus/4 the formula is the same. C728 owners should change the 63 to 65 and the 84 to a 86.

Mr Stone's letter about listing and computing certainly seems to have sparked off some interest. Mr Stone and other computer listers may be interested to know about a listing program that one of Your Commodore's readers is writing.

The program, called Classic Styles, allows you to design listing patterns for round, V neck, Raglan领 and Sleeveless jumpers using standard size or your own measurements. Once the pattern is designed it is displayed on the screen for you to copy, or, if you have access to a printer, you can produce a hard copy automatically.

Classic Styles is available from T.C. Mason, 15 Whitehouse Green, Avonlea, Northern Ireland, BT21 4JZ. Tel: 0691 6388. The program costs £12.95.

Mr Mason is also producing programs titled Fashion Styles and Skirts in the near future.

No one at Your Commodore has seen the programs, perhaps Mr Mason will send us a copy so that we can do a review—and replenish our collection of jumpers!

Dear Editor,

Much to enjoy your magazine I feel that I must write to express my dismay and frustration at the fact that, just as I am getting into a series, it seems to disappear for a few issues only to reappear when I am least expecting it, the Relative File programming series being a prime example.

Being fairly new to computing, I am used to series that run month after month without the irregular breaks that seem to appear in your magazine. I find this very irritating and I suggest that when gaps are unavoidable a word of explanation would not go amiss.

Having acquired a C128 earlier this year, I am struggling to get to grips with programming, and find the type of article that you publish important to me.

Another small niggle, I note that the price of the November issue has gone up by 10p. Unavoidable, you would no doubt say, and I do not really object to paying it. But most magicians would make some comment on price increase. I cannot find any mention of it in this issue.

K. Hollowell, Chesham

Printing series on a regular basis has always been something of an editorial nightmare for Your Commodore. The problem with our series is that many of them tend to require the inclusion of listings at the rear of the magazine. The Listings pages are one of the very last items to be designed together with the index, contents pages and the title. This unfortunately means that sometimes we simply do not have the space to fit in every single item that we would like to each issue. In an ideal world we would of course know exactly how long the listings section of the magazine was going to be and exactly how many pages of advertising we are going to have to fit in. Unfortunately this simply isn't the case, we just have too many pages to fit in the magazine and items get held.

We do make an effort to ensure that every series appears at least every other month.

We are investigating ways of producing series on a more regular basis, so you should notice a change for the better this year. Of course the age-old problem of our contributors not getting their articles to see when promised may still mean that we suffer a slight hiccup occasionally.

As for the price rise, yes, it was of course unavoidable to cover our own increased costs. The rising of the announcement of the cover price increase did not unfortunately allow the editorial team time to comment upon it in the magazine. Even at £1.29 I am sure that you will agree that Your Commodore will offer excellent value for all owners of Commodore computers who want to really use their computer to its limit.

Comfort and Joy

A joystick is an essential peripheral, but how do you decide which one to buy?

By Eric Doyle

It's impossible to say how many kinds of joystick there are, and even if I venture to quote a figure here, it will be out of date by the time that this magazine appears. Despite such competition, it's still a lucrative market, and companies like Konix have made their reputations solely on the sale of these little plastic assemblies.

It's a totally different story for the consumer. With most computer shops stocking just one or two styles, choosing the perfect joystick for an individual's need is not easy, especially when the purchaser can rarely test the stick before buying. Other considerations which probably form the principal motivations to buy are price and appearance. This is rather like buying a house because it looks pretty from the outside and seems to be a bargain. As any house buyer knows, this approach can be fatal, and any house must first be examined and then surveyed by a professional. In the end it may not be the prettiest looking house that is purchased, but the most suitable when all of the considerations have been weighed against one another.

A similar approach should be adopted when purchasing a joystick. Don't just dash in and buy the first stick that is thrust into your eager hands. Look around and decide which one you might like to own, ask the assistant if you can handle it, study any information that may be written on the box and then ask yourself a few questions.

Comfort and Quality

Is it pleasant to hold? Try pressing the fire button while wiggling the handle to see if the effort is liable to cause

any strain on fingers or wrist. Bear in mind that both left-handed and right-handed people may want to use it, so would the position of the fire button cause any problems? Is the base too big? Are any extra facilities easy to use?

Does the stick look well-made? How does the handle feel? Check to see that it doesn't flap around. If it is a microswitched model, listen to the switches as you push the stick around. Do they make a definite double click when selecting the diagonal positions?

Remember that you get what you pay for and that the switches can be of three principal types. The cheapest sticks usually use bubble switches, contact switches are found in the mid-range and microswitches are usually only employed in the most expensive models.

Bubble switches are the simplest type and work on the same principle as the cheap, old, rubberized computer and calculator keyboards. A piece of conductive material is held over two terminals by a rubber or plastic bubble. When the joystick is moved it presses the conductor down onto the terminals, completing a circuit between them, and the computer then receives a current through the corresponding wires. When the stick is released, the rubbery medium springs back into shape and contact is broken. After a while, this constant flexing will cause the membrane to rupture and, at the very least, the efficiency of the stick will be impaired.

Contact switches come in various forms but the principle is always the same. Usually the contacts are spring metal strips which are held about an eighth of an inch apart. When the

joystick is operating, one of the contacts is pushed against the other to complete the circuit, and when the pressure is relieved the natural springiness of the metal breaks the contact again. On the Numcon Stick Stick this principle is translated in a different way. The metal stem which acts as the core of the handle protrudes into a square well inside the stick's base. The rod forms one of the contacts and each side of the well has a small metal plate clipped onto it to form the other contacts. As the stick is wiggled about, the rod touches one or two of the plates and the current flows accordingly.

Microswitches are the most expensive and most reliable system which a joystick can use. The movement of the joystick depresses small buttons which activate contacts housed in small plastic cases. This miniaturization of the contacts means that the metal contacts can be flexed to enhance their natural spring and the whole system is less susceptible to metal fatigue than the normal contact switches.

So far only digital joysticks have been considered and these form 90 per cent of the types on sale. Analogue joysticks also exist, but these are much more complex in their operation.

Internally, the stick is connected to two ingeniously connected potentiometers. A potentiometer is a variable resistor which operates like a volume control. On audio equipment, the volume control acts like an electronic tap and, as the control is turned it allows more electricity to flow and the volume increases.

Similarly, in the analogue joystick the electricity is increased or decreased

the further the joystick is pushed in one direction or another. This means that the A/D (analogue to digital) converter in the computer can actually be programmed to detect how much current is flowing from such potentiometer and accurately position the cursor on a bit-mapped screen. Games are written with the digital stick in mind and this means that they only consider two states, on or off (current flow or no current flow). In my experience, the current detection on the joystick parts is sensitive enough to detect very low current flow so that




an analogue stick can be the most sensitive and reliable of all joystick controllers.

The problem on all Commodore machines is that access to the A/D converter circuitry doesn't use the same connection lines as the digital circuits. This means that an analogue stick may be totally useless as a games controller, but some sticks that were produced for MSX computers are actually wired in a configuration that allows them to pass for a possible Commodore joystick. If you can find any, they are excellent devices but rare,

and this survey will ignore analogue sticks because because buying one is a gamble if you can't try it out on a Commodore beforehand.

The Survey

Most joysticks will work perfectly well in the horizontal and vertical planes (N, E, S, W) but the diagonals (NE, SE, SW, NW) may not be so easy to obtain. This is because the switches are arranged so that only one switch's contacts have to connect for the main axis, but two closed switches have to be achieved simultaneously for

	<p>Model/Price Magnum £14.95</p>	<p>Details Mastertronic Black base Red handle microswitches Single red button microswitch DS: Excellent</p>	<p>Comments Pistol-grip styling. The firebutton is mounted on the rear of the platform and could be the source of some strain with protracted use. Nicely balanced but slightly awkward to hold. Not particularly suitable for shoot-em-ups.</p>
	<p>Model/Price Competition Pro £16.49</p>	<p>Details Dynamics Transparent base Red handle microswitches Dual red buttons DS: very good</p>	<p>Comments Exactly the same as the 500B except that there is a special autofire switch and the firebuttons are microswitched. The autofire is electronically controlled to simulate extremely rapid presses of the button and should therefore work with most games. The switch has an extra setting which claims to be slow motion. Take this with a pinch of salt - the control only pushes the outputs from the direction switches so that the main character under joystick control moves in 'slow motion', not the whole game. I've yet to think of an application for this, but if you can then this is the stick for you!</p>
	<p>Model/Price Tac-By £13.99</p>	<p>Details Suncom/Microprose Cream base Grey handle microswitches Triple red buttons microswitches DS: good</p>	<p>Comments Despite the firebutton-testing, ergonomically-designed handgrip, there's only one word to describe this stick: Tac-By. The handle feels sloppy and the firebuttons on the base are connected by a bar which acts on a microswitch in a see-saw manner. The result is an unreliable system which makes firing even more of a hit-and-miss affair than usual. The handgrip button on the review sample refused to work but this may be a problem with that particular stick - the lack of the draw.</p>

diagonal sensing. This means that diagonal sensitivity is a good test for an all-purpose, quality joystick.

In the individual surveys, the Details column indicates the supplier, colour of the base, handle colour, direction-sensing switch type, firebutton colour, fire-switch type, and diagonal sensitivity (DS). The grading for DS is based on the rating scale: poor, good, very good and excellent.

The Comments column forms a subjective appraisal of each stick and outlines any special features which the stick may possess.



The joysticks in order of preference

- The Navigator
- Blaster
- Competition Pro
- Competition Pro 3000
- Magnam
- Joystick Controller
- Tao 30
- Silk Stick

and a special mention for the IronTrooper as a suitable second buy.



Model/Price
Competition Pro 3000
£15.95

Details
Dynamics
Transparent base
Red handle
microswitches
Dual red buttons
DS: Very good

Comments
Although the direction sensors are microswitched, the fire button uses lower quality contact switches on plastic mounts which are susceptible to stress fractures. The handle has a positive feel and the unit is comfortable to hold.



Model/Price
Joystick Controller
£4.99

Details
Suncom/Micropress
Black handle
Black handle bubble switches
Single red button
bubble switch
DS: good

Comments
This is a later version of the 'Atari' which earned an excellent reputation as the official eight-bit stick for that company. Commodore owners soon realised that there was direct compatibility and fetched the official, dismal CBM stick for the shabby delight. Time has not been kind to the JC, but it can still hold its own against the other cheap sticks and is a good throwaway for those on a limited budget. For a bubble switched stick it is surprisingly responsive and reliable and is the only stick ever to have a replaceable switch board. Sadly, it's usually the handle that breaks off. The position of the firebutton makes this a right-hander's joystick.



Model/Price
Silk Stick
£6.99

Details
Suncom/Micropress
Black body
Orange/black handle
contact switches
Single orange button
contact switch
DS: poor

Comments
Despite the neat compact design, this stick is very unresponsive. The root of the problem may lie in its unusual direction-sensing switch arrangement, as outlined earlier in this article. The positive contact of the rod with the plates isn't helped by the grease placed in the well to reduce friction. As a non-conductor, the lubricant is designed to coat the handle stem and can make electrical contact difficult. Diagonal sensing is abnormal and the firebutton is right-handed.



Model/Price
Blaster
 £12.95

Details
 Replay/Compart
 Black/red base
 Red handle
 microswitches
 Dual red buttons
 microswitch
 DS: very good

Comments
 Although this looks almost exactly the same as the Competition Pro sticks, it does have a slight edge. The direction sensing, though adequate, could be improved by thickening the stem of the handle slightly. The autofire switch is sensibly positioned at the front of the base so that it can be switched on and off easily while a game is in play. Compared to the Navigator's system, this is the next best answer to overshooting.



Model/Price
Navigator
 £14.99

Details
 Konix
 Black base
 Blue handle
 microswitches
 Single blue trigger
 microswitch
 DS: Excellent

Comments
 The Navigator is the new pistol-grip stick from Konix and it looks like a refuge from a Starline's science fiction movie. In fact, it's almost a dead ringer for a Star Trek phaser. On first sighting, the stick received a cool, if not demure, reception in the office but its superior, smooth performance quickly won everyone round. The diagonal sensing is really excellent and the design of the Navigator is a lot more comfortable than the Magnum. The positioning of the firebutton as a pistol trigger means that the index finger can be used, which should make it more natural for first time users. The autofire switch does not operate until the trigger is held, which makes it excellent for most games and avoids the possibility of overshooting through high score tables and menu screens. A brilliant stick which shows that Konix has come a long way since its quirky Speed King design.



Model/Price
Icon/Troiler
 £13.99

Details
 Sanscom/ Micropross
 Cream base
 Grey handle
 bubble switches
 Single grey button
 bubble switch
 DS: good

Comments
 This is not a gamers stick and it doesn't even pretend to be one. It is designed for use as an lives and put-downs memory selector and, as such, it works very well. It is designed as a permanent attachment to the computer keyboard, and the plug has a covered input port on it so that a conventional joystick or mouse can be connected simultaneously. As an aid to GPOCS, an packages and music makers, it is well thought out and convenient. I even tried it on an Amiga 500 and the coiled cable could just scratch the mouse. Although the connection area is fitted with a sticky pad, I feel sure that most users will want to bolt this one on more permanently.

Relative File Programming

In previous articles we have looked at how to create, enter and process RECORDS, keep housekeeping files separate and update them. Now we have arrived at the most challenging series of routines of all - deleting records

By Eric Ramsay

Why should deleting records be so complex? Why not simply overwrite the RECORD with a CHR\$(255), remove it from the RSRT%() sorted RECORD number array, and that would be it, wouldn't it?

Well it's not quite that simple. If a file contained 100 RECORDS, for instance, and the user deleted 30 of them, and then entered thirty more RECORDS the file would not contain 100 RECORDS, but 140: the thirty RECORDS he had previously deleted would still be within the file, lying fallow, as it were, taking up file space but doing nothing.

So we have to aim, in the Delete RECORD programming, to do the following:

- Delete the actual RECORD from the file.
- Delete the RECORD in the sorted RECORD array.
- Store the number of the deleted RECORD in a delete RECORD array.
- Assign any entry RECORD operation to the first deleted RECORD in the delete RECORD array, then remove this entry in that delete RECORD array, and store the new RECORD in the sorted RECORD array.

Delete record routine

I have found this routine useful in the browser menu - after all, you have to be looking at the RECORD in order to decide whether to delete it. This routine completes the browser option programming.

The first lines are quite straightforward; they merely check that the user has not pressed the 'Delete' key by mistake.

```

3280 rem **** delete record
subroutine*****
3290 print"DELETE RECORD:-
Are you SURE (y/n)"
3300 getkey$:(key$="n")then
3310rem ***return to Browser

```

Having received confirmation, the RECORD deleted counter, DRDC, is incremented by one. The current RECORD number is then stored in the deleted RECORDs array (DOUT%). Now the write RECORD variable WREC is assigned to the RECORD number to be deleted, and DISK% is declared as the create character, CHR\$(255). Then the write RECORD subroutine is used to overwrite the current RECORD.

RASK% next, do not forget your record pointers routine 4114 before you go to the write RECORD.

```

3310 drec=drec+1:next%=(drec)+
next%+drecp
3320 wrec=next%+(drec):disk$=chr$(
255)
3330 gosub 4080

```

There, the RECORD is deleted. But the number is still in the sorted RECORDs Array, RSRT%. This means that the RECORD will still appear if you ask for that sorted number. Clearly, this will not do. We have to delete the RECORD entry in the array. We start a loop beginning from the number to be deleted and running through to the end of the file, RN.

```
3340 for po= drc to rn
```

Now we assign the RSRT% number for the deleted RECORD to the next RECORD entry in the array, and so on through the loop.

```
3350 next%=(po)+next%+(po+1)
```

At the end of the loop, the deleted

RECORD number has disappeared, and RN is now 1 too many, since we have just deleted a RECORD. So 1 is deducted from RN, and also from the FINISH variable in the browser mode:

```
2300 ren:=ren-1:fin:=f-1
```

And then we return to the Browser Routine:

```
2370 goto 2020
```

So the deleted RECORD no longer holds any data in the file, but the physical RECORD space still exists. We now have to program to enable that RECORD to be used in the next enter RECORD operation, otherwise it will be ignored forever, wasting file space.

We add the following line to the enter RECORDS routine. This detects if there are any deleted RECORDs in this file using the deleted RECORD counter DREC:

```
2570 ifren > 0 then gosub 2580: go to 2600
```

If there are deleted RECORDs, the following subroutine is called:

```
2580 ren **** assign deleted record to a write *
```

Since we will always want to use the first deleted RECORD from the array, the WRIC variable for the write operation is assigned to ROUT%(1). The sorted RECORD array is given this number, and then the same number is deleted from the delete RECORD array, ROUT%, using the same kind of loop you have already seen.

```
2590 wren:=rou%(1):wrt%=(rn)-rou%(1):farp=1: drec:=rou%(1):pou:=rou%(1):nstrps
```

Then, since we now have 1 less deleted RECORD, 1 is deducted from the delete counter, DREC, and the program RETURNS to line 2570. The line then GOTOs 2000.

```
2600 drec=drec-1  
400 return
```

Effectively, the program has bypassed the normal RECORD number assignment in order to use a deleted RECORD. All the housekeeping is updated and the new RECORD will remain at the end of the file until the next SORT. Now we have to add a new loop to the housekeeping:

WRITE HOUSEKEEPING — BASIC 2.5*

```
200 n1$=LEFT$(HSE^"NAMES"  
-----",16)  
210 dupen=1,*(n1$),w:gosub-  
2610  
220 print=3,rc,rd,drec:gosub2620  
230 for a=0 to c  
240 print=3,f:fd%of:gosub2630  
250 print=3,f:fd%a: gosub 2610  
260 nexta  
270 ifpou=1 then  
280 print=3,wrt%:p:gosub2610  
290 next pou:fd:=0:dn:=0:rcm **  
300 rous=ROU%:if no DREC  
400 forp=1 to drec  
310 print=3,rou%:p:gosub2610  
320 nextpou  
330 drec:=gosub2630  
340 return
```

READ HOUSEKEEPING — BASIC 2.5*

```
150 n1$=LEFT$(HSE^"NAMES"  
-----",16)  
160 dupen=1,(n1$),r:gosub2610  
170 input=3,r,rc,d:gosub2610  
180 for a=0 to c  
190 input=3,f:fd%of:gosub2610  
200 input=3,f:fd%a: gosub2610  
210 nexta  
220 forp=1 to rc  
230 input=3,r:rd%:p  
240 next pou:fd:=0:dn:=0:rcm **  
250 rous=ROU%:if no DREC  
250 forp=1 to drec  
260 input=3,rou%:p:gosub  
270 drec  
280 return
```

We have added the storage and input of the Variable DREC, and a loop to store and input the ROUT%(1) Array if there are any Deleted RECORDs in the File. If there are none, both the INPUT * and PRINT * Loops are skipped.

BASIC 2 HOUSEKEEPING

I have found, while using the BASIC 2 of the Commodore 64, that PRINT * statements sometimes do not work so well writing several

numeric variables to disk separated by the comma ','. If you find any difficulty in INPUTTING the variables in line 200, then the PRINT * statement in Line 250 is more probably at fault. Use separate PRINT * statements for each variable:

```
220 print=3,rc:gosub2610  
230 print=3,r:rc:gosub2630  
240 print=3,f:fd%of:gosub2610  
250 print=3,f:fd%a:gosub2610
```

INPUTTING the Variables in line 270 will then work correctly.

Sequential Search METHOD — 2 Read Method

You now have all the routines required to write and read all the RECORDs in the file. Using these routines is merely a matter of practice, and here I am going to suggest another search method which, instead of searching for a string within the Key\$FIELD will search an entire file for a given string. The process is quite simple. We can break it down to the following:

- OPEN the File: INPUT the Search String.
- Limit the Search to parts of the File.
- Begin Search Loop.
- Read RECORD, Search for String.
- Match found, store RECORD number.
- End Loop.
- Display RECORD numbers found, use NO\$WRITE to Display or Print the RECORDs.
- Return to File Menu.

If you have followed this series, you will have all the routines needed to accomplish this. The following is for the 1 or 2 RECORD read method. Those using the field searched method will be dealt with later.

Let us say that this routine will begin at the line 1000. Of course, you may RENUMBER any of the routines as you wish.

```
1000 rem**** File Search Routine.  
1010 rc=0:dupen=3,(name$(c),rc),  
fd%,d:gosub2610  
1020 print"directory":dn:=dn+1  
1030 print"File "a+(dn*7):Subject  
"Field":a:nexta  
1040 print"Input Search Data?"  
1050 input a$  
1055 gosub 4210: rem **Limit Rout-  
line  
1060 print "[clearscreen] Record
```

```
Processing Now."
1070 loop:loop to file print "home" % po
1080 print "Matches Found " % n
1090 rmove: rem File RECORD
Number used
```

At this point, the screen has been cleared, (or WINDO/Wid if you have a C128) and the SEARCH has been INPUTed. A message is displayed and the current RECORD number being accessed is displayed.

You may wish, at this point, to have the RECORDs accessed in sorted order, or sequentially: it is entirely up to you. As the read RECORD number variable, REEC (or RP for Basic 2 users) is declared, this can either be the file RECORD number, here the loop label PO, or the Sorted RECORD number can be used.

```
1080 rrr = BSRT%(po) rem Sorted
RECORD Number used.
```

The search result will be the same, except that by using the sorted RECORD number the RECORDs matched will be in sorted order, but because the read/write head on the drive is skipping about the file finding these sorted RECORDs the search will take slightly longer.

Whether you choose, the assigned RECORD is Read:

```
1100 gosub 4120 rem *** Read
RECORD
1110 gosub 4114:gosub 4120:rem for
BASIC 2 users
```

Now, instead of breaking up the DISKs collected record string, we use it in one go to search the entire RECORD, and if a match is found, the RECORD number is stored in the RESULT array, RES%.
 Because here the Array (RES%) is used to store the RECORDs matched, this array will need to be DIM'd, if you anticipate many RECORDs in a file, particularly those BASIC 2 users with comparably low RAM to use, it may be better not to use an array to store the result, but to print the RECORD matched, either to printer, or to the screen. A separate subroutine would be best here. Another possibility

```
1110 if instr (disk$(a$) & chr$(n) =
chr$(1) & n) rem for rp for BASIC
2)
```

is to OPEN a separate sequential file, and simply PRINT # the RECORD number matched to this file, for later reading and displaying, in which case you would have OPENed the sequential result file before the Loop FD begins.

```
1015 dopen # 1:file$(?) "result"
:name$(10),dl,dl,w,gosub 3640
```

and the search line of the routine would then be:

```
1110 if instr (disk$(a$) & chr$(n) =
chr$(1) & n) + 1:rem for rp for BASIC
2)
```

BASIC 2 users already have their own search string routine which will take the place of INSTR, which can be copied and placed here:

```
1110 for:1 to len(disk$(a))-len(word)
1111 if mid$(disk$(a),i,len(word)
& chr$(n) & len(disk$(a)-len(word)
& chr$(n)) = word then
1120 next i
1120 next a, po
1130 close:gosub 3640
1140 [BASIC 2] close 1:close$
```

At the end of the Loop every RECORD in the file will have been searched for the string, and the numbers of the RECORDs matched will either have been stored in RES% or in a sequential result file. The Routine would then continue like this:

```
1150 print "[clear screen] Results of
Search for " & s
1160 rs = " Matches Found."
1170 if rp = 0 then "Press any key
for Menu."
1180 for:po:line: rem * Start
result Loop
1190 rrr=rrr%(po):gosub 4120:rem **
Read RECORD
1200 display:rrr%(po):gosub 4120:rem
**** Display Record
1210 "Press any Key for
NextMatch">getkey:rs
1220 next po
```

FIELDS SEPARATED METHOD

If you elected for the FIELDS separated method of writing and reading the RECORD then you must

make some changes to the sequential search routine. Since you do not have a DISKs and the RECORD returns from the read routine already divided into the FIELDS array DISP% you will have to search the RECORD within a loop. Make these changes. These are for the sequential disk file method of storing the results.

SEQUENTIAL SEARCH FIELDS SEPARATED BASIC 2.5-

```
1105 for a = #0:oc
1110 if instr (disp$(a$) & chr$(n) =
chr$(1) & n) + 1:rem for rp for BASIC
2)
1120 next a, po
```

SEQUENTIAL SEARCH FIELDS SEPARATED BASIC 2

```
1110 for:1 to len(disp$(a))-len(word)
1111 if mid$( disp$(a),i,len(word)
& chr$(n) & len(disp$(a)-
len(word) & chr$(n)) = word then
1120 next i
1120 next a, po
```

SEQUENTIAL LISTING OF RECORDS

Another form of output which you might consider useful is the listing of RECORDs, either to printer, disk or screen. I will detail a simple routine now which you may adapt to suit your particular needs. My own programs use this sequential listing routine to output the results of searches as well as straightforward lists. However, I shall leave you to accomplish that with your own changes to the following Routines.

```
1200 dopen # 5, (name$(1)/rrc:dl,dl,
dl,dl,dl)
1210 l=0: rrr="**** List Counter set
to 0
1220 print "[clearscreen]">for:#0:oc
1230 print "Field " & i:tab(7) "Subject
" & disp$(a) & n
1240 print "Which Field to List?"
1250 gosub 4120:for:rrr=1:rem ** n)
will need DIM
1270 print "Another Field to List">get
key:yy$& if yy$="y" then goto 1240:rem
**** get another Field
1280 gosub 4120: rem ** Limit
Routine
1290 print "[clearscreen] Record
Processing Now."
1400 for:po:loop to file print "home" % po
1410 print "Matches Found " % n
1420 rmove: rem File RECORD
Number used
1430 [for BASIC 2] open po:gosub 4114
```

If you require the list to be in sorted order, you will need the RECORDS to access the sorted RECORDs array, like this:

```
1420 rsc=sort%(p)open " " access in
Sorted Order
1430 [for BASIC 2:]rpsort%(p)
```

Then the RECORD is read and put into the field array, DISP%:

```
1430 gsub#1,33;gsub# 4180
```

and Listed, in this example, to Screen:

```
1440 for a = 0 to 10:print
display(data;screen a;print
1450 Next a
1460 close
1470 goto 7 [wherever your File Menu
begin.]
```

Of course, the above example merely lists your RECORDs to the screen. You would add a request at the beginning of the routine to request the type of output required by the user, and then program the appropriate output, but the output loop remains the same. Note that this has changed from the ordinary file loop.¹

```
FOR A = 0 TO C
```

or

```
FOR A = 0 TO LC: PRINT
```

DISP%)/NEXT A
Which will display only those fields requested by the user.

Those of you who have used the FIELDS separated method will not need to use the separate RECORD into FIELDS routine, since your RECORD returns from the READ routine already read into the array DISP%.

Thus you have it-- all the routines necessary to program your own relative files. Now let us look at a layout of a typical relative file program to assist you in the planning of your own.

PROGRAM PLANNING

Exactly which routines you include in your own programs depends much on what you want it to do. If it is a dedicated program, for instance, you will not require the FIELD pointer routine, since the FIELDS will always be exactly the same whenever the program is RUN. But let us look at a typical program layout for a variable relative file.

This program would be required to produce any number of different files. Use the routines along the line. Be careful to include the general variables required before using the read and write routines or there will be unpredictable results. Follow these general rules:

* Always declare the current RECORD number before using the

read or write routines. Depending on the part of the program this RECORD number can be PO, DISP or RN.

* If the RSRT% array has been used in the RECORD number declaration then always ensure that it is used when BOTH reading and writing the RECORD.

* When DOPENing both relative and sequential files, ALWAYS use the 'optional' D%:0:0 in the Statements. Although the statements will work well without it, if the drive and device numbers are omitted then only two channels may be used at the same time, instead of three. Only one relative file may be DOPENed at the same time.

* Always give the RECORD statement [as PRINT = 15,"p" for BASIC 2] twice. This eliminates any chance of a DOS error when accessing the RECORD.

* Use the disk check routine on EVERY drive access.

* DO NOT forget to DCLOSE the files when access has finished, or data will be lost. Remember, DCLOSE closes ALL open channels, to ensure that all processing has been completed before the DCLOSE statement is encountered by the program. BASIC 2: Leave the command channel IS OPEN all the time, but do not forget to CLOSE all files at the end of processing. The best way of ensuring this is that the LAST file channel OPENed should be the FIRST to be CLOSED.

Now here is the Program layout:

**FILE LAYOUT --
RELATIVE FILES**

TITLE SCREEN

PROGRAM MENU:

Create New File	Create Routine	Save Housekeeping Menu	Go to File Menu
Load File -	Load Housekeeping Menu	Quit Program -	

FILE MENU

Issue RECORDs	Increment Counter RN	Input RECORD Routine	Write RECORD routine	Return to File Menu
Issue RECORDs	Display Routine	Limit routine	Copy Delete Print Search	Return to File Menu
Search RECORDs	Sequential Search Routine		Read RECORD, Match	Return to File Menu
Print Template	Print all FIELDS and LENGTHs, and Variables to Printer			Return to File Menu
Change KeyFIELD	Change KeyFIELD Routine #00		Save @ mem Housekeeping	Return to File Menu
Sort RECORDs	Sort RECORDs only	Limit Routine	Read RECORDS, List	Return to File Menu
Sequential List	Get FIELDS to List	Go to Program Menu		Return to File Menu
Exit Program	Save @ Housekeeping			

That Was The *Commodore* Year That Was

1988 has been a busy year for C64 and Amiga owners, so here is a potted history through the pages of Your Commodore

January

As the snow comes and American football fans stay up late to watch the Washington Redskins winning the Superbowl, the price of the Amiga is raised to £499.99, after weeks of speculation, and is bundled with Deluxe Paint and The Very First serial pack. Domestic release *Star Wars: EA* is skating or dying, and *Moson* launch the long-awaited but disappointing *Ice, Power Masters*. Other big games are *Final Master* (Ocean/Dynamix) and *Zig-Zag* (Image Works).

February

Commodore sponsors Texas Sanderson in the hope of more TV coverage when she goes for gold in the Seoul Olympics. Argus Press Software's management buys the company and forms Grandlam Entertainment.



Top game of the month is MicroPro's *Archon: The Rite of Power*, with Logotron's *ADM*, Mitromoff's *Tenix* and *Idolium's Need and Bers* worthy of honourable mentions.

March

Monthend announce that the PC Show will be held at Earl's Court instead of Olympia in September. The *Hexxon* serial (Telecomsoft) agreement that started at last year's show rumbles on as Telecomsoft is allowed to release *Mooshon* and *Magnavox*. Alternative Software signs up the rights to the back catalogue of *Prionia*, *Asah*, *Spex*, *Invector* and *Shible*. *Rat*, meanwhile Mastertronic picks up Activision's title.

April

The Commodore jinx strikes as *Chri-ax*, complete with CBM logos on their shirts, is relegated to Division 2. The cartridge is beats up with the launch of *The Final Cartridge III* and *Action Replay IV*. Ocean releases its game based on the multi-Oscar-winning film *Pollan*, and Rainbird continues to set new standards in adventures with *Jester*.

May

Micro-master, Bob Hubbard, who was doing rather well over here, decides to go over there as he joins Electronic Arts in California. The Americans were obviously very impressed with his music for games such as *Chasy*, *Conan*, *Monty on the Run*, *Samurai* and EA's own *Blade of the Legion*. Logotron releases its 1285 series of low-cost business programs which offer an integrated suite of wordprocessing, database and spreadsheet programs for only £12.85 each. The Power House gains sales, and the top games are *4th and 4th* (the last of Activision's games for US Gold) before



Project Seattle: Future

signing up with Electronic Arts) and Mitromoff's *Project Seattle*. *Alpha*, Gallop claims Amiga software sales have tripled, and new strains infect the Amiga.

June

At the Commodore Show the Amiga drops in price again, from £499.99 to £399.99, and the C64 is bundled in the Commodore Olympic pack comprising a C64, database, joystick and ten sports games for only £149.99. Grandlam signs a deal with Datasoft that brings *Adventure*, *Archie* to the UK and takes the *Power for Real* *Overkill* to the States. The Power House signs up Canada's Sydney Development Corporation, famous for games such as *Demolition* and *Fight Fight*, which formerly released its games through US Gold. *Year* Amiga goes solo. EA's *Sidekick* *Archie* brings modern naval warfare to the C64. Activision changes it's name to MeGiame. *Code Masters* launches £2.99 disk software.

July

Code Masters announces the *Race Against Time*. EA releases *Hard's Tale II* and the surprise of the year, *Wasteland*. *Conan* debuts from US Gold to release their games through Microprose and promptly produces



Interprose

one of its best games - *The President is Missing*. *MUD* (Multi-User Dungeon) breaks free from its modern constraints and appears on the C64. EA's *Interprose* sends Amiga game

sales soaring to new heights. Microsoft also changes its name in the hope that Image Works.

August

Commodore cuts the cost of its PC1 from £149.99 to £99.99 to take on the Amstrad PC. US Gold signs a deal with Pepsi and new label, King, gives some of their old titles a second stab at the charts via the budget market.



Commodore

This time round the cost is £1.99 for old favourites such as *Guards* and *Microcrax*. CBM cuts the cost of its PC once again, this time it's priced at £115. The Power House goes under.

September

September is dominated by the PC Show at Earls Court and is heralded by an amicable end to the Hewlett-Packard dispute. At the centre of the Show is Commodore's mainstay, (well that's what it looks like), where the abilities of the Amiga are shown off to an admiring public as the stage is set for further Amiga and C64 announcements. The £149.99 Amiga will now have a TV modulator bundled with it and the C64 is to be bundled in two new packs: the Hollywood Box costing £149.99 and comprising a C64, datasets, joystick and ten TV and film theme games, and the Commodore Home Entertainment Pack (£189.99), that also features a personal stereo and a Yamaha SHS-10 electronic keyboard. *Track Six Manager* surprises many (including its producers, *Griffith Games*) by toppling *Football Manager II* from the top spot.

October

The Commodore jinx strikes again as Tennis Sanderson fails to qualify for



Red Storm Rising

the javelin final at the Seoul Olympics. US Gold releases the first of its *Dungeons and Dragons* games, *The First of Redburn*. Microprose goes Commodore-bashing in the computer game version of Tom Clancy's *Red Storm Rising*.

November

Now I must reach for the crystal ball again as deadlines and production schedules mean that I have to write this before the Commodore Christmas Show, where many major announcements are expected. Will the C64 be bundled yet again? Who will Commodore jinx next? One thing is looking

certain - that is set to be a shortage of Amigas.

December

The big guns bow to Christmas with *Quincy*, *Operation Wolf*, Activision's *Afterburner* and US Gold's *Demolition* - all competing for the top spot.

As part of this round-up of the year, we've selected our personal favourites from the products that have provided the highlights of the year. This is never an easy task, and we're sure you'll



disagree with at least half of our selections. So, instead of sitting there frowning at the month, get pen to paper and tell us what you think.

Best Sports Game

4th and Inches by Aerobike

Sports games have never been better, in a year when the legendary *Football Manager* finally had a sequel but was robbed of the glory by Griffith's *Track Six Manager*. Dicky Thompson had

another *Olympic Challenge* but failed to win a medal. *CraterBoard* from World Class and EA produced the bizarre *Mad-Fut*. Eyes continued it's *Games* series with the *Wheeler Edition* and then the *Summer Edition* but we finally agreed for *4th and Inches* as it promotes the action and excitement of American Football (not an easy task) in a very playable form.



Best Role-Playing Game**Wasteland by Electronic Arts**

RPG is a category that has grown in maturity this year and has finally broken free from adventures and the straitjacket of linear problems and non-descriptions. The late fall climax of the promised release of *Cyberia II* has left the way open for others and, despite the excellent *Dungeons and Dragons* game, *Pool of Radiance*, and EA's *Lord of the Rings* and *III*, the award must go to *Wasteland* which appeared out of the blue and amazed all who played it. The scenario was imaginatively set in post-holocaust America and added special skills to the arsenal of the player.

Best Adventure Game**Corruption by Rainbird**

Embodied, with the considerable help of Magnolia Novella, last year's adventure about as far as they could go with *Corruption*. Although Infocom, the past masters, had minor hits with *Sherlock*, the intriguing *Bend Sinister* and the confusing *Lord and Sorcerer*, *Mafia Road* or *Tail of a Dog*, it fell out as Rainbird turned to stunning graphics which have given adventures a new lease of life.

Corruption is exceptional in its concept and execution, and proves that you don't need magic and monsters to create a gripping adventure.

Best Strategy Game**Red Storm Rising by Microprose**

We had plenty to shout about in this category with Electronic Arts releasing *Patton vs Rommel* by Chris Crawford, while introducing Australian wargamer, SSG Strategic Studies Group, with its unique style of games which includes *Mail of Marstonia*, *Storm* and *Director Battle of the American Civil War*.

It was also EA who introduced the UK to a new breed of all-action strategy game with *Strike Force*, but Microprose stole the show with *Red Storm Rising*, which added depth and variety to the real-time strategy genre and proved that wargaming could be more than just chess with knobs on.

Best Simulation

SQUAD DETAILS	
DEFENDER	POSITION
1	GOALKEEPER
2	DEFENDER
3	MIDFIELDER
4	ATTACKER
5	CURRENT SQUAD

REPORT SELECT EXIT

Track Suit Manager by Goldfish Games

Microprose certainly changed the slight attitude towards flight simulators with *Garage* and this year's follow up, *Steady Flight*, certainly earned on the tradition. Maybe before the year is out, Digital Integration's *F-16 Combat Pilot* may add new dimensions to this particular area of simulation.

Although a certain company seems to think that any old game can be described as a simulator, we did think that the popular concept of flight sims was too narrow and decided that the time had come to move the goalposts and award our accolade to a sports simulation with a difference.

Track Suit Manager may not be



the purist idea of a simulator, but Goldfish Games' first release certainly takes in every aspect of an International Soccer manager's life. From the cries of adulation when things go right, to the howl and cry of the Press when things go wrong, the seasons of the team roll fairly and squarely on the shoulders of the team manager in this game. In fact, if ever people tried playing *Track Suit Manager*, a certain real life manager might be getting a more sympathetic hearing at the moment. From the dreary design of *The Double* comes the most convincing simulation of real life that we have ever seen.



Best Arcade Game

Airborne Ranger by Microprose



Once again Microprose pop up with a game which was also considered under the Simulation category. With its novel approach to arcade-style, war-based games, *Airborne Ranger* is to Commodore what *The Bard's Tale II* is to PC-Macs.

This was the most hotly fought decision but some of the candidates had to be ruled out by default. We would dearly have liked to have been able to award this category to Activision's *After Burner*, Ocean's *Oppression*, Wisp or US Gold's *Thunderblade*, but their late appearance means that they will have to fight it out with the 1989 nominees.

Other games which were considered were Grandstream's faithful conversion of Pac-Land, Palace Software's fast and furious *Arm Kicker*, Imagine's brilliant *Salomander* and Image Works' *Force Flight*. Back in its novel, tongue-in-cheek approach, Microprose came in first because of the originality and variety of the gameplay plus the superb graphics.

Best Software House

Electronic Arts

Obviously, the likes of US Gold and Ocean are always in the running and Image Works and Madlogue have marked their name changes with a kind of yearly improved games. However, Electronic Arts has produced a steady string of hits including *Shoe or Die*, *Strike Fleet*, *The Avision Collection* and *Lord's of Comper* and, through its associated companies *Acadule*, *SSG* and *Interplay*, classic games including *Bard's Tale III*, *Warcraft*, *Power at Sea*, *The Tean* and *Hall of Monsters*.

Best Business Package

GeoPublish/Microprose
(Berkeley Software)

GeoPublish, turned the QDOS operating system into front page news with this desktop publishing utility that has features to rival many of its PC-based counterparts, but for a fraction of their cost.



For sheer value-for-money and power the Logstrup 1299 scores almost twice this award with the Filer 1295

database, Planner 1299 spread sheet and Writer 1299 wordprocessor providing a compatible, interactive business package.

Best Productivity Tool

Big Blue Reader



This is a genuinely useful program, providing a pathway to swap data between the C128 and the M5-DOS environment of an IBM PC or compatible. Using the multiple forwarding capabilities of the 1511 disk drive, Big Blue Reader not only allows the retrieval of information from a 5.25 inch M5-DOS disk, but also allows the C128 to write to this format too.

Best Programmer's Utility

Action Replay Professional IV by Data Electronics

As handy utilities, it is hard to beat today's cartridges. These were four competitors: *Action Replay*, *Final Cartridge III*, *The Asper* and *Protec Machine*. All excellent candidates for praise but we thought that *Protec Machine* was a little limited. *Final Cartridge* tried to do too much and failed, and *The Asper* had the mixed



blessing of a RAM-based system. Only *Action Replay* seemed to supply the best of all worlds with the famous turbo system, a useful sprinkling of extra basic commands and a disassembler which also contained special disk commands as a bonus.

Minibase 128

Need to keep tabs on your stamp collection? Or do you have more serious uses? Minibase may be the answer

By Martin Parker

Minibase is a very simple way of storing anything from a mailing list to an index of your record collection on a C128.

The first thing you will need to do when using it is to create a file. Once you've loaded the program in, RUN it and you should see a main menu as follows:

1. CREATE FILE
2. LOAD FILE
3. DELETE FILE
4. DISPLAY DIRECTORY
5. RENAME FILE
6. CLEAN UP DISK
7. COPY FILE
8. VIEW RESIDENT FILE
9. ERASE RESIDENT FILE
- A. PRINTER OUTPUT ON/OFF

These are largely self-explanatory, but it's worth running through a few details. For a start Minibase operates wholly on memory — it only uses the disk to load/save the file you are operating on in memory — the resident file.

Creating a file requires you to enter a filename which must be between one and 18 digits long. You can then specify how many records you want in your file, followed by the number of fields you want in each record, which can be anything from one to 28.

Next you must specify a name for each field, which will be the same for

all records. Each field name can be up to 30 characters long.

You can then enter the data record by record. The computer will prompt you with the record number and field name. Data of up to 40 characters long can be entered. Entering a null character (" ") will result in a "-" being placed in the field.

Once you've created the file, you can save it to disk.

You can get the file back by using the LOAD FILE option on the menu. Once you've loaded the file, the system gives you a list of file parameters, which consists of the filename, number of records and number of fields per record. Pressing a key will then give you a list of field names.

Finally, pressing another key will give you the sub-menu, which allows you to operate on the file. This reads:

1. VIEW A RECORD
2. PRINT FILE
3. SEARCH FOR RECORD
4. AMEND FILE
5. RETURN TO MAIN MENU

Option 1 requires you to enter the number of a record, which will then be displayed for you. The record will do the same as Option 1, but send the data to the printer.

Searching will ask you to set up a search complex, by entering a search record, field by field. You can of course

leave any field blank, if you don't care what goes in it.

Amending a file requires you to enter the record number you wish to change. The record will be displayed for you to change. Following changes, you can save the whole file to disk if you wish.

Going back to the main menu, you can delete a file from disk with option three. The program will double check deletion with you.

Option 4 will show you the disk directory without affecting the memory contents.

Option 5 allows you to enter a new name for any of the files.

The clean-up option, Option 6, will reallocate the RAM on the disk, which will free space for more files.

The file copy, Option 7, asks you for a filename. It will then be loaded in and can be renamed and saved.

View Resident File simply switches to the file handling sub-menu, which we have already covered.

Erase Resident File clears the current memory contents.

Finally, the last option will dump a lot of output to hard copy. This will include file parameters and positive searches.

Getting it in

Minibase is supplied in the form of a Basic listing. For advice on entering this, refer to our Listings page.

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If you think that one of our programs looks very interesting, but you can't afford the time to type it in then our software service will help you out

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Everyone has probably faced this problem. When it does happen it's a matter of spending hours searching through the program for any typing mistakes. No matter how long you look at how many people help you, you can usually guarantee that at least one little bug slips through unnoticed.

The Your Commodore Software Service makes available all of the programs from each issue on both cassette and disk at a price of £6.00 for disk and £4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

INFONET LTD, 5 River Park Estate, Northamsted, Herts
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Tel: (04427) 36651

Please contact this address for prices and availability.

The Disk

Programs on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programs much easier. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a strap containing the article type, C64 Program etc. So that you can see which programs are available on which format, you will also find a couple of symbols after this strap. The symbols have the following meaning:



This symbol means that the program is available on cassette.



These programs are available on disk.

Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk-only programs on tape. There is no sense in playing a program that expects to be reading from disk on to tape.

AUGUST 88

MAKING MUSIC - Programs to accompany August's installment of our super music series (C64).

SHORT INTERLUDE - Overcome the problems of handling more than one interrupt with this handy routine for machine code programmers (C64).

TAPE ORGANISER - A high speed program filing system for cassette users. (C64).

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SPRITE LIBRARY - Alienspaces are the subject of this installment (C64).

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SEPTEMBER 1988

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OCTOBER 1988

SPRITE LIBRARY - In this installment our sprites take on the look of the alphabet (C64)

SAMPLER 44 - See September 1988 for details (full program on both September and October disks and tapes.)
SET THE ALARM - Use the C64's in-built clock as an alarm.

JACK IN THE BOX - A handy box utility for Basic and machine code programmers. (C64).

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MASTERING THE RASTER - The source code to accompany our article on raster interrupts. (C64)

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Database table

Title	Supplier	Price	Program type	Max field size	Max record size	Noninteger database	Programmable?	Optional?	Comments
Superbase III	Proxima	\$99	Adult catalog	256bits	32K fields	Limited to 64K	Yes	Yes	The IBM database. It costs a lot more than the others, but it could be worth it's weight in gold.
File 1000	Logotron	\$75.00	List of sales	8bits	30 fields	30,000	No	Yes	Excellent value for money. 30,000 is a limitation that for \$75.00 you get a reasonable program.
Mini Office II	Starbase	\$74.00	Integrated	8bits	20 fields	500 records	No	No	A cheap and efficient package that also contains a rep, spread sheet, notes and graphics.
Visitor	View-TEK	n/a	spreadsheet	256bits	64 fields	80000	No	Yes	Also includes business profiles and a spreadsheet.
Missy Magic	Superbase	\$28.00	Notes	8bits	24 fields	Limited to 64K space	Yes	Yes	This one has a couple of it's own as you program more applications including making a record.
Graphix	Microbase	\$24.00	with Graphix	256bits	64 fields	Limited to 64K space	No	No	It "grows" as what you want" program with a fully integrated part of the OS/20 system.

Name
Address
Date joined club
Firms currently on list
Firms that have been hired

- 1 - Hoover
 - 2 - Adventure
 - 3 - Comedy
 - 4 - Western
 - 5 - Adult
 - 6 - Sci-Fi
- Total firms hired

The fields of a database do not need to be just a passive string of characters; they can also include calculations such as totals of each type of film hired and an overall total so you could quickly interrogate the database to find out who are your best customers.

Similarly, a club secretary could use a database of members to keep track of who owed subscription

payments and send them reminders to settle their accounts.

As you can see, a database can be more than just a passive card-index file, because it can put the stored data to work in anything from label printing to giving a personal touch to mail-merge programs. To get the best use out of a database program it should therefore be compatible with other programs such as a wordprocessor with a mailmerge option, or with a spreadsheet for interrogating important figures. One way of ensuring this is to opt for an integrated system, such as Mini Office II, or for Logotron's Filer 1290, which is part of the 1290 series, which can be built up to form an integrated system of a database, wordprocessor and spreadsheet.

The undisputed leader for the C64 is Superbase from Precision Software. This is arguably the only true C64 database, because it also includes its own programming language through

which you can devise your own applications that for example prompt your user for details of a customer order, and will then display the total price for them, taking into account customer and bulk discounts, special offers and VAT.

Choosing which database is right for you can be a difficult and confusing task. For many, it will be the price that makes the final decision but you should also consider the the number of fields per record and records in a file that the database supports, as this may limit certain applications.

If the database outputs its files in standard ASCII format then the same files can be exchanged with non-Commodore systems, increasing its usefulness.

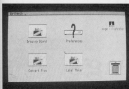
To help you find your way through this jungle, we've compiled a table that highlights some of these important features so that you can choose the right program for you.

Defining a Filer File Database using Logotron's Filer 1290



A Mapple memo driven stack control database application





Page Illustrator



One problem with the 80-column mode C128, is that it's always perceived as an accurate engine. Its graphics capabilities have usually been made little use of. The high-resolution equivalent to 80-column mode, a respectable 640 x 360 pixels, actually means that Commodore are marketing high-resolution graphics up to the standard of the BBC B or the Amstrad CPC3 (Wow!).

Not the usual point - where's the software for it? Well, someone's looking at the problem, anyway. Home Illustration from New Jersey-based Pasch is a combination of an Amiga-type workbench and a drawing package, Home Illustrator.

This sounds like an ambitious one, since it sounds exactly as though it provides a total operating environment. But no, I have to spit it out early in this review, Home Illustrator is an ill-considered piece of software.

The Workbench is all very well, though a little simple. It's really just a way of accessing disk files as icons using a pointer. Real Amiga-type working instruments use the front end of a machine design philosophy. I've never felt that patch-on-wimp systems like GEM offered the user much. This one is doubly redundant, as it struggles to make a silk purse out of an 8-bit machine.

The meaty bit of Home Illustrator is the drawing package. This is crippled by two deadly problems. It is not remotely user-friendly, and it is 5-L-G-W. It obviously writes in some sort of sluggish high-level language, so waiting while you move the paintbrush around the screen can be a painful experience.

After offering a workbench, you would think that the package would offer an icon-driven paint package, huh? No chance. Home Illustrator

operates in its modes: lockand, lines, boxes, circles, text, change colour, polygons, copy, ellipses, and I/O. To access these you have to keep flipping around using, get this, not even the function keys, but Control and a numeric. On top of all this, while in a mode, you have to look up a vast range of keys to use various different functions.

Now I'm not a mouse-witch everything fanatic, but one thing I think drawing packages should be is friendly. This one isn't. The annoying thing is that the same company has supplied a better drawing package as a throw with their excellent Basic 8.0, so all I can say is get that and you won't need Home Illustrator.

By Fin Fahey

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 blocks 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 use of spaces in layman's terms, and [SA0] would mean a row of ten of these symbols.

[B+2] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+2] 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 [RNC4] or, exceptionally, [SSPC4]. 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, DOWNLEFTS, BLUE,
FAC0

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 FJ 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 ([VFN9]), type the relevant number of inverted T's and then hold down CTRL and press zero ([VSC0]). Next type another quotation mark and delete it again. Now finish the line and press RETURN.

A lot 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=20/PI*0

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

PROGRAM: SYNTAX CHECKER

© 1987 ERIC DOYLE - BASIC MODE

```

10 BL=00 (24*70) 100+0000
20 FOR L=0 TO 80:PRINT TAB 80-L;
  "
30 READ A:IF A=0:PRINT"00000000000000000000"
40 IF L=0:PRINT"10011111111111111111"
50 IF C2=0:PRINT"000-0.010+0.0-0.0000"
  "
60 PRINT A:IF A=0:PRINT"00000000000000000000"
70 IF L=0:PRINT"10011111111111111111"
80 IF C2=0:PRINT"000-0.010+0.0-0.0000"
  "
90 PRINT L:IF L=0:PRINT"00000000000000000000"
100 IF L=0:PRINT"10011111111111111111"
110 IF C2=0:PRINT"000-0.010+0.0-0.0000"
  "
120 PRINT 2:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
130 PRINT 3:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
140 PRINT 4:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
150 PRINT 5:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
160 PRINT 6:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
170 PRINT 7:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
180 PRINT 8:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
190 PRINT 9:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
200 PRINT 10:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
210 PRINT 11:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
220 PRINT 12:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
230 PRINT 13:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
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260 PRINT 16:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
270 PRINT 17:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
280 PRINT 18:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
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300 PRINT 20:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
310 PRINT 21:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
320 PRINT 22:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
330 PRINT 23:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
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510 PRINT 41:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
520 PRINT 42:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
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550 PRINT 45:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
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600 PRINT 50:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
610 PRINT 51:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
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660 PRINT 56:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
670 PRINT 57:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
680 PRINT 58:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
690 PRINT 59:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
700 PRINT 60:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
710 PRINT 61:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
720 PRINT 62:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
730 PRINT 63:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
740 PRINT 64:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
750 PRINT 65:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
760 PRINT 66:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
770 PRINT 67:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
780 PRINT 68:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
790 PRINT 69:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
800 PRINT 70:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
810 PRINT 71:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
820 PRINT 72:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
830 PRINT 73:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
840 PRINT 74:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
850 PRINT 75:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
860 PRINT 76:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
870 PRINT 77:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
880 PRINT 78:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
890 PRINT 79:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
900 PRINT 80:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
910 PRINT 81:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
920 PRINT 82:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
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940 PRINT 84:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
950 PRINT 85:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
960 PRINT 86:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
970 PRINT 87:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
980 PRINT 88:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
990 PRINT 89:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"
1000 PRINT 90:PRINT"1.41592653589793238462643383279502884197169399375105820974944592307816406286209"

```

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've not made 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 turn brown 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 SYS48152 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 small. To turn your computer to lower case mode press the Commodore key and the SHIFT key at the same time. ☐

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
[RYSON]		CTRL & 3
[RYSOFF]		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]		£
[LARBOW]		←
[UPARROW]		↑
[P8]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		rev text
[Clear]		CBM + letter
[Store]		SHIFT + letter

YOUR

COMMODORE

Listings

Dupro

PROGRAM - DADPRO

NOTE - THIS PROGRAM IS FOR COMMODORE ONLY



```

00 5 FPK SET UP SCREEN & BORDER
01 10 FPKS SCREEN-8 FPKS SCREEN-9
02 10
03 80 PRINT"CLR, WHITE, BRIGHTEN
04 PLEASE WAIT"
05 10
06 10 KEY LEAD THE DATA INTO PE
07 10
08 10
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0 10 40,87,88,78,84,88,88,78
10 40
11 100 DATA 78,78,71,21,30,78,78,78
12 0,87,88,78,84,88,88,78,78,88
13 78,78
14 100 DATA 71,30,78,78,78,48,7
15 9,88,83,84,73,78,73,87,88,84
16 78,78
17 100 DATA 78,30,78,78,78,71,0
18 8,83,84,73,78,73,87,88,87,73
19 78,78
20 100 DATA 38,78,78,78,78,88,8
21 8,88,88,88,78,78,78,88,88,88
22 88,88
23 100 DATA 78,78,78,88,87,78,7
24 7,77,88,78,88,88,88,88,88,78
25 73,71
26 100 DATA 78,77,88,78,84,88,7
27 8,78,88,88,78,78,78,71,88,77,88
28 78,84
29 100 DATA 38,78,78,78,78,73,7
30 8,88,88,88,84,78,78,71,38,78
31 73,78
32 100 DATA 88,78,78,78,88,88,8
33 8,78,88,88,78,78,71,38,78,73
34 78,88
35 100 DATA 78,88,88,88,88,88,8
36 8,88,88,78,78,78,88,88,88,88
37 88,88
38 100 DATA 88,38,78,78,78,88,8
39 8,78,84,88,88,88,78,73,78,88
40 38,78,88
41 100 DATA 77,88,38,88,88,88,88,8
42 8,71,88,88,88,88,78,88,38,88
43 78,71
44 100 DATA 78,88,88,88,88,78,8
45 3,73,84,73,78,78,88,88,88,73
46 78
47 100 DATA 84,88,88,38,84,78,8
48 8,78,38,88,88,88,88,88,38,88
49 78,71
50 100 DATA 88,88,88,88,88,88,88,8
51 8,108,108,108,88,88,108,108,108
52 108,108,108,78,88
53 100 DATA 1,108,11,108,38,88,8
54 108,108,11,108,108,108,108,108
55 108,108,108,38
56 100 DATA 818,88,108,108,11,108,8
57 8,88,38,88,88,108,88,108,88,88
58 7,108,88,88,88
59 100 DATA 7,88,818,888,888,78
60 1,88,108,88,11,108,7,88,88,8
61 888,888,888,888
62 100 DATA 108,88,108,88,88,88,88
63 8,7,108,108,108,108,108,108,108
64 108,108,108,108,108,108,108,108
65 108,108,108,108,108,108,108,108
66 108,108,108,108,108,108,108,108
67 108,108,108,108,108,108,108,108
68 108,108,108,108,108,108,108,108
69 108,108,108,108,108,108,108,108
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94 108,108,108,108,108,108,108,108
95 108,108,108,108,108,108,108,108
96 108,108,108,108,108,108,108,108
97 108,108,108,108,108,108,108,108
98 108,108,108,108,108,108,108,108
99 108,108,108,108,108,108,108,108

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0 78 108 8 108 8 108 8 108 8 108 8
10 88
11 100 DATA 108,888,888,108,108,108
12 11,108,108,108,88,108,88,108
13 108,108,108,88,108,108,108,108
14 108,88,88,88,88,88,88,88,88,88
15 108,88,88,88,88,88,88,88,88,88
16 108,88,88,88,88,88,88,88,88,88
17 108,88,88,88,88,88,88,88,88,88
18 108,88,88,88,88,88,88,88,88,88
19 108,88,88,88,88,88,88,88,88,88
20 108,88,88,88,88,88,88,88,88,88
21 108,88,88,88,88,88,88,88,88,88
22 108,88,88,88,88,88,88,88,88,88
23 108,88,88,88,88,88,88,88,88,88
24 108,88,88,88,88,88,88,88,88,88
25 108,88,88,88,88,88,88,88,88,88
26 108,88,88,88,88,88,88,88,88,88
27 108,88,88,88,88,88,88,88,88,88
28 108,88,88,88,88,88,88,88,88,88
29 108,88,88,88,88,88,88,88,88,88
30 108,88,88,88,88,88,88,88,88,88
31 108,88,88,88,88,88,88,88,88,88
32 108,88,88,88,88,88,88,88,88,88
33 108,88,88,88,88,88,88,88,88,88
34 108,88,88,88,88,88,88,88,88,88
35 108,88,88,88,88,88,88,88,88,88
36 108,88,88,88,88,88,88,88,88,88
37 108,88,88,88,88,88,88,88,88,88
38 108,88,88,88,88,88,88,88,88,88
39 108,88,88,88,88,88,88,88,88,88
40 108,88,88,88,88,88,88,88,88,88
41 108,88,88,88,88,88,88,88,88,88
42 108,88,88,88,88,88,88,88,88,88
43 108,88,88,88,88,88,88,88,88,88
44 108,88,88,88,88,88,88,88,88,88
45 108,88,88,88,88,88,88,88,88,88
46 108,88,88,88,88,88,88,88,88,88
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59 108,88,88,88,88,88,88,88,88,88
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61 108,88,88,88,88,88,88,88,88,88
62 108,88,88,88,88,88,88,88,88,88
63 108,88,88,88,88,88,88,88,88,88
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65 108,88,88,88,88,88,88,88,88,88
66 108,88,88,88,88,88,88,88,88,88
67 108,88,88,88,88,88,88,88,88,88
68 108,88,88,88,88,88,88,88,88,88
69 108,88,88,88,88,88,88,88,88,88
70 108,88,88,88,88,88,88,88,88,88
71 108,88,88,88,88,88,88,88,88,88
72 108,88,88,88,88,88,88,88,88,88
73 108,88,88,88,88,88,88,88,88,88
74 108,88,88,88,88,88,88,88,88,88
75 108,88,88,88,88,88,88,88,88,88
76 108,88,88,88,88,88,88,88,88,88
77 108,88,88,88,88,88,88,88,88,88
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81 108,88,88,88,88,88,88,88,88,88
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90 108,88,88,88,88,88,88,88,88,88
91 108,88,88,88,88,88,88,88,88,88
92 108,88,88,88,88,88,88,88,88,88
93 108,88,88,88,88,88,88,88,88,88
94 108,88,88,88,88,88,88,88,88,88
95 108,88,88,88,88,88,88,88,88,88
96 108,88,88,88,88,88,88,88,88,88
97 108,88,88,88,88,88,88,88,88,88
98 108,88,88,88,88,88,88,88,88,88
99 108,88,88,88,88,88,88,88,88,88

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LISTINGS

61	8,170,000, 300,18,000,30,100,0	67	8700 0074 950,000,70,07,100,100	73	8000 0074 950,000,70,07,100,100
62	8000 0074 100,000,000,100,100	68	8000 0074 950,000,70,07,100,100	74	8000 0074 950,000,70,07,100,100
63	8000 0074 100,000,000,100,100	69	8000 0074 950,000,70,07,100,100	75	8000 0074 950,000,70,07,100,100
64	8000 0074 100,000,000,100,100	70	8000 0074 950,000,70,07,100,100	76	8000 0074 950,000,70,07,100,100
65	8000 0074 100,000,000,100,100	71	8000 0074 950,000,70,07,100,100	77	8000 0074 950,000,70,07,100,100
66	8000 0074 100,000,000,100,100	72	8000 0074 950,000,70,07,100,100	78	8000 0074 950,000,70,07,100,100
67	8000 0074 100,000,000,100,100	73	8000 0074 950,000,70,07,100,100	79	8000 0074 950,000,70,07,100,100
68	8000 0074 100,000,000,100,100	74	8000 0074 950,000,70,07,100,100	80	8000 0074 950,000,70,07,100,100
69	8000 0074 100,000,000,100,100	75	8000 0074 950,000,70,07,100,100	81	8000 0074 950,000,70,07,100,100
70	8000 0074 100,000,000,100,100	76	8000 0074 950,000,70,07,100,100	82	8000 0074 950,000,70,07,100,100
71	8000 0074 100,000,000,100,100	77	8000 0074 950,000,70,07,100,100	83	8000 0074 950,000,70,07,100,100
72	8000 0074 100,000,000,100,100	78	8000 0074 950,000,70,07,100,100	84	8000 0074 950,000,70,07,100,100
73	8000 0074 100,000,000,100,100	79	8000 0074 950,000,70,07,100,100	85	8000 0074 950,000,70,07,100,100
74	8000 0074 100,000,000,100,100	80	8000 0074 950,000,70,07,100,100	86	8000 0074 950,000,70,07,100,100
75	8000 0074 100,000,000,100,100	81	8000 0074 950,000,70,07,100,100	87	8000 0074 950,000,70,07,100,100
76	8000 0074 100,000,000,100,100	82	8000 0074 950,000,70,07,100,100	88	8000 0074 950,000,70,07,100,100
77	8000 0074 100,000,000,100,100	83	8000 0074 950,000,70,07,100,100	89	8000 0074 950,000,70,07,100,100
78	8000 0074 100,000,000,100,100	84	8000 0074 950,000,70,07,100,100	90	8000 0074 950,000,70,07,100,100
79	8000 0074 100,000,000,100,100	85	8000 0074 950,000,70,07,100,100	91	8000 0074 950,000,70,07,100,100
80	8000 0074 100,000,000,100,100	86	8000 0074 950,000,70,07,100,100	92	8000 0074 950,000,70,07,100,100
81	8000 0074 100,000,000,100,100	87	8000 0074 950,000,70,07,100,100	93	8000 0074 950,000,70,07,100,100
82	8000 0074 100,000,000,100,100	88	8000 0074 950,000,70,07,100,100	94	8000 0074 950,000,70,07,100,100
83	8000 0074 100,000,000,100,100	89	8000 0074 950,000,70,07,100,100	95	8000 0074 950,000,70,07,100,100
84	8000 0074 100,000,000,100,100	90	8000 0074 950,000,70,07,100,100	96	8000 0074 950,000,70,07,100,100
85	8000 0074 100,000,000,100,100	91	8000 0074 950,000,70,07,100,100	97	8000 0074 950,000,70,07,100,100
86	8000 0074 100,000,000,100,100	92	8000 0074 950,000,70,07,100,100	98	8000 0074 950,000,70,07,100,100
87	8000 0074 100,000,000,100,100	93	8000 0074 950,000,70,07,100,100	99	8000 0074 950,000,70,07,100,100
88	8000 0074 100,000,000,100,100	94	8000 0074 950,000,70,07,100,100	100	8000 0074 950,000,70,07,100,100

LISTINGS

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174,12,1097
70 7000 DATA 202,241,12,010,141
   175,478,202,00,010,140,120,1
   70,21,020,141,0100
71 7000 DATA 202,240,100,000,240
   9,020,000,000,000,000,000,0
   10,000,0,0000
72 7000 DATA 99,100,000,000,000
   100,120,001,100,000,100,000
   110,100,000,100,0000
73 7000 DATA 000,00,100,010,101
   000,100,000,100,0,100,10,10
   1,000,1,000,0000
74 7000 DATA 000,100,0,0,0,0,0
   0,100,0,000,000,0,0,0,0,0
75 7000 DATA 99,100,000,000,000
   100,120,001,100,000,100,000
   110,100,000,100,0000
76 7000 DATA 000,00,100,010,101
   000,100,000,100,0,100,10,10
   1,000,1,000,0000
77 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
78 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
79 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
80 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
81 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
82 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
83 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
84 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
85 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
86 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
87 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
88 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
89 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
90 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
91 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
92 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
93 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
94 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
95 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
96 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
97 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
98 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
99 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00
100 7000 DATA 00,0,00,0,00,0,0,0
   0,00,0,00,0,00,0,00,0,00

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Profab Sprites

PROGRAM .BPT ED LOADER



Before trying this program in or running it you should enter the following:

```

PROMPT A,B,CDEF4,0
PROMPT A,B,CDEF

```

When you load this program it will force the machine code into memory and then show the finished program on disk or cassette.

```

10 10 01-007.00-00-00-00-00
20 20 FOR L=0 TO 255:GOSUB PGR
30 TO 255:GOSUB PGR:GOTO 20
40 40 GOTO 0
50 50 FOR L=0 TO 255:GOSUB PGR
60 TO 255:GOSUB PGR:GOTO 50
70 70 FOR L=0 TO 255:GOSUB PGR
80 TO 255:GOSUB PGR:GOTO 70
90 90 FOR L=0 TO 255:GOSUB PGR
100 TO 255:GOSUB PGR:GOTO 90
110 110 FOR L=0 TO 255:GOSUB PGR
120 TO 255:GOSUB PGR:GOTO 110
130 130 FOR L=0 TO 255:GOSUB PGR
140 TO 255:GOSUB PGR:GOTO 130
150 150 FOR L=0 TO 255:GOSUB PGR
160 TO 255:GOSUB PGR:GOTO 150
170 170 FOR L=0 TO 255:GOSUB PGR
180 TO 255:GOSUB PGR:GOTO 170
190 190 FOR L=0 TO 255:GOSUB PGR
200 TO 255:GOSUB PGR:GOTO 190
210 210 FOR L=0 TO 255:GOSUB PGR
220 TO 255:GOSUB PGR:GOTO 210
230 230 FOR L=0 TO 255:GOSUB PGR
240 TO 255:GOSUB PGR:GOTO 230
250 250 FOR L=0 TO 255:GOSUB PGR
260 TO 255:GOSUB PGR:GOTO 250
260 260 FOR L=0 TO 255:GOSUB PGR
270 TO 255:GOSUB PGR:GOTO 260
280 280 FOR L=0 TO 255:GOSUB PGR
290 TO 255:GOSUB PGR:GOTO 280
290 290 FOR L=0 TO 255:GOSUB PGR
300 TO 255:GOSUB PGR:GOTO 290
310 310 FOR L=0 TO 255:GOSUB PGR
320 TO 255:GOSUB PGR:GOTO 310
320 320 FOR L=0 TO 255:GOSUB PGR
330 TO 255:GOSUB PGR:GOTO 320
330 330 FOR L=0 TO 255:GOSUB PGR
340 TO 255:GOSUB PGR:GOTO 330
340 340 FOR L=0 TO 255:GOSUB PGR
350 TO 255:GOSUB PGR:GOTO 340
350 350 FOR L=0 TO 255:GOSUB PGR
360 TO 255:GOSUB PGR:GOTO 350
360 360 FOR L=0 TO 255:GOSUB PGR
370 TO 255:GOSUB PGR:GOTO 360
370 370 FOR L=0 TO 255:GOSUB PGR
380 TO 255:GOSUB PGR:GOTO 370
380 380 FOR L=0 TO 255:GOSUB PGR
390 TO 255:GOSUB PGR:GOTO 380
390 390 FOR L=0 TO 255:GOSUB PGR
400 TO 255:GOSUB PGR:GOTO 390
400 400 FOR L=0 TO 255:GOSUB PGR
410 TO 255:GOSUB PGR:GOTO 400
410 410 FOR L=0 TO 255:GOSUB PGR
420 TO 255:GOSUB PGR:GOTO 410
420 420 FOR L=0 TO 255:GOSUB PGR
430 TO 255:GOSUB PGR:GOTO 420
430 430 FOR L=0 TO 255:GOSUB PGR
440 TO 255:GOSUB PGR:GOTO 430
440 440 FOR L=0 TO 255:GOSUB PGR
450 TO 255:GOSUB PGR:GOTO 440
450 450 FOR L=0 TO 255:GOSUB PGR
460 TO 255:GOSUB PGR:GOTO 450
460 460 FOR L=0 TO 255:GOSUB PGR
470 TO 255:GOSUB PGR:GOTO 460
470 470 FOR L=0 TO 255:GOSUB PGR
480 TO 255:GOSUB PGR:GOTO 470
480 480 FOR L=0 TO 255:GOSUB PGR
490 TO 255:GOSUB PGR:GOTO 480
490 490 FOR L=0 TO 255:GOSUB PGR
500 TO 255:GOSUB PGR:GOTO 490
500 500 FOR L=0 TO 255:GOSUB PGR
510 TO 255:GOSUB PGR:GOTO 500
510 510 FOR L=0 TO 255:GOSUB PGR
520 TO 255:GOSUB PGR:GOTO 510
520 520 FOR L=0 TO 255:GOSUB PGR
530 TO 255:GOSUB PGR:GOTO 520
530 530 FOR L=0 TO 255:GOSUB PGR
540 TO 255:GOSUB PGR:GOTO 530
540 540 FOR L=0 TO 255:GOSUB PGR
550 TO 255:GOSUB PGR:GOTO 540
550 550 FOR L=0 TO 255:GOSUB PGR
560 TO 255:GOSUB PGR:GOTO 550
560 560 FOR L=0 TO 255:GOSUB PGR
570 TO 255:GOSUB PGR:GOTO 560
570 570 FOR L=0 TO 255:GOSUB PGR
580 TO 255:GOSUB PGR:GOTO 570
580 580 FOR L=0 TO 255:GOSUB PGR
590 TO 255:GOSUB PGR:GOTO 580
590 590 FOR L=0 TO 255:GOSUB PGR
600 TO 255:GOSUB PGR:GOTO 590
600 600 FOR L=0 TO 255:GOSUB PGR
610 TO 255:GOSUB PGR:GOTO 600
610 610 FOR L=0 TO 255:GOSUB PGR
620 TO 255:GOSUB PGR:GOTO 610
620 620 FOR L=0 TO 255:GOSUB PGR
630 TO 255:GOSUB PGR:GOTO 620
630 630 FOR L=0 TO 255:GOSUB PGR
640 TO 255:GOSUB PGR:GOTO 630
640 640 FOR L=0 TO 255:GOSUB PGR
650 TO 255:GOSUB PGR:GOTO 640
650 650 FOR L=0 TO 255:GOSUB PGR
660 TO 255:GOSUB PGR:GOTO 650
660 660 FOR L=0 TO 255:GOSUB PGR
670 TO 255:GOSUB PGR:GOTO 660
670 670 FOR L=0 TO 255:GOSUB PGR
680 TO 255:GOSUB PGR:GOTO 670
680 680 FOR L=0 TO 255:GOSUB PGR
690 TO 255:GOSUB PGR:GOTO 680
690 690 FOR L=0 TO 255:GOSUB PGR
700 TO 255:GOSUB PGR:GOTO 690
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9.168.168.168.131.1275	8.147.248.8.143.268.32.268.1	178.7.268.268.178.1.13.1.4.182
44 1129 DATA 133.129.162.164.16	8.147.248.32.31.214.258.82.228.	1.68.168.168.8.4.187.248.12.1
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8.133.168.168.120.1207	1478 DATA 201.43.208.11.100.	87 1718 DATA 8.136.16.208.169.2
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8.133.148.148.137.2287	8.147.248.32.31.214.258.82.228.	07 1718 DATA 4.136.16.247.76.18
43 1184 DATA 146.143.151.143.14	8.170.133.133.164.258.232.13	5.18.108.7.182.178.132.8.
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83 1184 DATA 248.168.168.168.14	327.32.248.228.238.238.79.12	252.39.4.1777
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5.144.133.133.144.2077	327.32.248.228.238.238.79.12	88.28.24.32.148.255.155.98.1
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1.133.142.168.168.168.139.14	5.231.281.255.2842	32 1728 DATA 258.258.248.252.26
8.158.158.158.158.158.158	1478 DATA 248.248.247.265.24	8.248.248.248.248.248.248.248
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Competition Winners

In our August 1988 edition, we gave you the chance to one of ten winners of products from Trilogic.

Ray Beaulieu of Rugby is the lucky winner of an Expert cartridge, voice digitiser and a Datasoft Doctor.

The following have all won their choice of either a Voice Digitiser or a Datasoft Doctor:

G.O. Brown, Washington, Tyne & Wear.

G. Beeton, Kyle, Isle of Wight.

D. Parish, West Wickham.

D. Cook, Carlisle, Blackpool.

P.T. Collins, Mynahoe, Cardiff.

P. Wopman, Feltham, Middlesex.

S.W. Smith, Stroud, Gloucestershire.

J.F. Hanson-Brown, Crowtham, Aldershot.

K. Hinch, Newstead.

In September we teamed up with Cade to give you a chance to win a

DG-20 guitar synthesizer. Mr Cathal Mooney from New Ross in Ireland will no doubt be annoying the neighbours with some strange noises from his prize.

October gave you the chance to be the proud owner of a Datal Robot Arm and all associated software. Mr Chris Garbutt from Baddles will no doubt have great fun with his prize.

The following runners-up will all receive a copy of the *Illusion Painter* graphics package:

D. Husley, Arans, Dublin.

M. Treacy, Down, Ireland.

M. Le-Vallée, Paisley.

Mark Skingle, Basingstoke.

The relevant companies have been given the names and addresses of the prize winners. Prizes will be sent out by them.

Program Corrections

The most kindness certainly seems to have attacked the listings with some frequency in our November 1988 issue. The programs MONSTER LDR and WTE.BAS both have a section of their listings missing. You will find the offending lines reproduced here.

You may like to know that the kindnessman responsible for losing the relevant information is no longer allowed to use anything sharper than a dessert spoon.

MONSTER LDR

```

0000 DATA 255,255,255,255,255,255,255,255
0010 255,255,255,255,255,255,255,255
0020 255
  
```

WILLIAM TELL (WTE.BAS)

```

0010 DATA 97,97,97,97,97,97,97,97,97,97
0020 0,0,0,0,0,0,0,0,0,0
  
```

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