

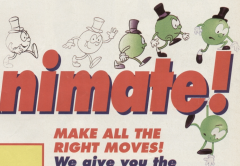
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COMMODORE FORMAT

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ISSUE 56 • £3.99 • MAY 1995

WRITE
to the editor of
Commodore
Format



Animate!

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of value



0 950 0804 56

When you buy this magazine you don't get it in order to read this. If you can find someone to read the magazine, and you can't find a replacement.

**Tips
to disk
SMART!**
Turn to p. 5



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Look out for the PRICER's utility on the coverpage. (Eun On the Powerpack, James & Mike is forward the latest in CD-ROMs.)

In animation—what it is and how to do it. It might not turn you into Walt Disney, but Walt's no less funny. Absolutely no kidding! Monkey Mouse!

1990

Philosophy of Animation - 1990

8 Games arena



Andy Roberts settles down with some new games and makes a pooking sound with his finger and his chest. Why? Because he can.

17 Grin and repair it! Part II

Do you run to the casualty department with a wiff? Do you groan gaping, getting wounded? Clumsie not Jason Finch takes you through diagnosing a sick C64, assessing the gravity of the situation and suggests remedial action - where appropriate.



5 ON THE POWERPACK...

FROST

Learn to animate with this powerful, yet easy-to-use utility. It's neat, fast and your imagination is the only limit, almost.

Harrier

Flying a jumbo jet has never been such fun, especially during a war.

Space War

3D blasting action is all yours in this fun game.



Superstrike

Trigger finger not tired yet? Then try this muscle-shoofers-up-for-vice. But wait a minute - no-one's saying it's going to be easy.

Darkest Road (Part II)

Do you find Road is a chilling fantasy level adventure which is sure to set your pulse a-tickin' and your brain a-thinkin'.

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Home time

Get internet access (or use 'Open all hours', above) for getting these using a-mail? Then why not try pointing your browser at <http://open.allhours.com> to see the World Wide Web home page of CF contributor Jason Finch.

Are you hooked (up)?

One in seven people own a computer according to a recent survey. This means that, each day, around 2500 households acquire a computer.

Nearly one third of these are second hand and nearly half are not the first to be bought by the household. The

report, by GFI Marketing Services Ltd, says 26 per cent of purchases are replacements and 17 per cent are additional computers.



Yes, you can see the stuff! The Internet, and nothing just sit about. If what you do it, there are three million people and more, and they're all waiting for you.



Lion thing

Lions of the London (previously CF) is now available £1.95 on disc, from £295, 9176 Dogstar Road, Purley, Surrey CR0 0BF. Max 0201 000 7000.

ICPUG for less

Membership of the group ICPUG (Independent Commodore Product Users Group), which currently has 18 full seats for C64 users and which publishes a bi-monthly journal, costs £20 per annum including £1 for the group share certificate. However, you can buy part year membership for the period from May to December £10.00 for that period including the £1 for the co-op share. This gives you four issues of the newsletter and access to all other facilities.

John Bennett, Chairman, ICPUG, 61 Deodar, Crow Lane, Gylesse, Surrey CR0 0BF. Tel: 01883 606600

C&A notes

Last Jack and brother, Jason Powell, are arranging and composing old C&A tunes, mainly of the Rob Hubbard variety, and will happily make copies for anyone who is interested.

At New York, Australia, 061 0544 0541 0542 074 087

Open all hours

Commodore Format is open to all corners in all countries, at all hours from all angles!

If you have internet access (perhaps through college?) you can now access the CF home page either by logging at <http://open>

followed on subtyping the Future Publishing World Wide Web page at <http://www>

<http://www.futurepub.co.uk/computing/commodoreformat.html>

A letter in Just March 1999 explains how you can get Web page links and menus files using a mail. So, you can use your C&A to retrieve just the text from a World Wide Web page, for example the Futurepub site detailed above, including the hyperlinks listed at the end of the message. You also retrieve binary files - for example, programs, images and MIDI files - in the way. There's plenty to do on the net if you've got a C&A, and it's well worth looking into as a hobby. Remember, net magazine is available at all times!

Commodore Format

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WIN! WIN! WIN! WIN! WIN!

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Comics Group,
Commodore Format, 50
Hammerhead Street, Baff
Aston B4 7 9PW before
Friday, 6 June, 1999.



THE MIGHTY BRAIN

Bad game, bad game

Here are my Bottom Five games:
 1 *Championship 2* - 35%
 There are a lot of graphical glitches in it.
 2 *Championship 1* - 40%. No comment.
 3 *Alban* - 37%
 It has four difficulty levels. That's all.
 4 *Supermagic 2000* - 37%
 Magic. Jackpot on the C18 looked better.
 5 *Wander Day* - 37%
 It's too easy to die.
 Michael Jones, Whitton

Pit yourself against The Mouth of the Brain. Write to TMB, Commodore Format, 30 Monmouth Street, Bath, Avon BA1 2BW or cf@futurenet.co.uk putting 'TMB' in the subject line.

It's a 'Dan'ed shame

I notice that 'Dan Dan' could be the best 'em-up the C64 has been waiting for. With a demo of the game appear on a future Powerplay?

Also, it's about time CF held another Art Party (AP) and you could give prizes for the best entries, too.
 Art Peters, Newfield

Unfortunately, Jim Wells has been having major headaches with CF. Demand has become rather disillusioned with the whole thing.

However, as Commodore Format was spoken for it will continue producing the game for originally envisaged. So if you want to continue writing it

send in your letters of encouragement (and praise) you'll buy it and will forward them. TMB

May-I domination?

I would like to see Mayhem 2 come out as it is one of the best games ever.
 Christopher Dismont, Whitton

Do you want in a strange temporal period?

First among sequels

I would like to congratulate you and CF on keeping the mag going. Although it's smaller, the quality is still very high. Here for some questions:
 1 Was Trencher the first editor of CF? Or, if the answer is no, who?
 2 Have you been with the mag from the start, too?
 Greg Shepherd, Northampton

The first editor of CF was, in fact, the legendary old group Steve Jamel, who went on to launch the monthly theme Edge magazine. And, yes, I'm a former member. I have been with the magazine from the start, as has Andy Roberts. TMB

TMB catch-'em-ups?

Right, I've got proof that there is no single best in C64 to reply to a letter you said that Banister was your favourite shoot-'em-up, yet in C64 you clearly stated that *Ultimate* was your favourite C64 shoot-'em-up. You've made a catch-up, money, in fact, you will be satisfied.
 Simon Hillier, Colchester

If making catch-ups were proof of non-existence there would be a great hole where the House of Commons was supposed to be. Actually, what you've submitted is a scam! I was on at the time, taking bookorders to recreational games. But only games I believed in, of course. (B) There's a party by the way - Ed TMB

PC = Post Commodore?

How that John and Steve Rowlands don't produce C64 games could you tell me what they are up to? Simon Hillier, Colchester
 PS I love *Ultimate* Jackson

The Apes Boys are working on something fresh that for the PC which may or may not be like a certain game that's been made into a film recently. B). I hope Emma Jackson isn't your English teacher. TMB

Game dropping

What is *Dropout*?
 Stuart Henderson, Birmingham

It's either a sequel, shoot-'em-up that was on C64's Powerplay (get a look here now - plug, plug) a doublet (in with history) (drop out) parcelling, or one of the best SF novels ever written. TMB

C64 Scene Directory

Clubs

NorthEast

- 1/6 South Coastly, 55 High Road Road, Droylsden, Manchester M20 6RS and to 660 6600 (Independent Commodore Friends Group Support)
- 43 Southcoast, Gateshead, Gateshead, Tyneside NE10 6NS 0200000
- 15 Arthur Avenue, Gateshead, Great Yarmouth, Norfolk NR10 6NF

Comms

- ADREN (see line address) 0145 790 0300 03 = 0145 290 0300 (see line address) 0191 266 0300/0344
- COMPUSERS = 0800 097070
- DELTA INTERNET = 0175 707 7150
- DESK CONNECTION = 0180 517 0190

Hardware

- ELECTIC 8070 ENTERTAINMENT SOFTWARE - 817c Brighton Road, Worley, Surrey GU8 5BP fax/+ 081 448 7100

Indie Software Companies

- ELECTIC 8070 ENTERTAINMENT SOFTWARE - 817c Brighton Road, Worley, Surrey GU8 5BP fax/+ 081 448 7100 0800000
- 81 The Bay Road, King's Lynn, Norfolk PE30 4BB = 01463 740013

Mail Order

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- 14 Ridgeway Road, Salisbury, Wiltshire SP1 3BB = 01753 680040
- WIGRAM GAMES
- 1 North Marine Road, Scarborough, Yorks YO12 6YF = 01945 326000/023000

PD Libraries

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- 34 Parkside Road, Buxton, West YBS 20W = 01462 376274 043000 0070 PD (C)
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- 41 Norton Avenue, Stone Green, Wigan W62 8B 0000 (UK)
- 81 Parkside Place, Glasgow, Scotland G62 1JG 0000007 PD (C)
- 78 Wharfedale Road, Sheffield S10 2BB 0000 0000 PD (C)
- 8 Keller Gardens, Croydon, Surrey CRO1, Northbrook Industrial S122 5BB 00000000 00700000 (UK)
- 81 1/2 Stone Lane, Runcorn, Cheshire W63, West Midlands S70 4LQ = 01204 77173, Fax = 01204 661000/Megabyte Software@btinternet.com 0000 (C)
- 88 Windsor Avenue, Whitland, County Carmarthen, South Wales SA67 9BB 0000000 0000 (C)
- 700 Bay 201, Wrexham GU8 5BP 000000 PD (C)
- 10 Crossways Road, Andover, Hampshire, GU10 2BQW 0000

Upgrades/Repairs

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- 1001 London Road, Luton LU2 6PP = 0116 247 0000
- ELECTIC 8070 ENTERTAINMENT SOFTWARE - 817c Brighton Road, Worley, Surrey GU8 5BP fax/+ 081 448 7100 0000000 (C) = 0181 2012000

Help to help you

To help bring the directory up-to-date please send changes or suggestions for inclusion to: CF Directory, Commodore Format, 30 Monmouth Street, Bath Avon BA1 2BW, whitland@futurenet.co.uk putting 'CF directory' in the subject line.

COMMODORE
PRODUCT

FROST

UTILITY

POWER PACK

GAME

HARRIER

PD

SUPERSTRIKE

PD

Darkest Road Part 2 Spacewar

POWER PACK

You've waited all month for this. We've worked for the past 30 days to get it to you. We enjoyed putting it together and now you can enjoy putting it to the test.

3D Space War

The man who stands like a heroic male galactic hero, he doesn't equal for a real male character - he's called Ali Fropo, please come again that not all about 'on-up construction kit' games have to be the same.



Shoot. The man will all the... in Ali Fropo War.

3D Space War is an Operation what style shooter but not that is set in a galaxy far, far away. You control the laser finger using your joystick and shoot away at puffing hot rockets, and pretty soon into the game there's a lot of movement.

It's more than it sounds, and a handsome fan, it was signed: The Lego people who give you mission briefings, that is.

Superstrike

It's an "Hyper double hit the month later available on CD and double shot out, it's made real." Superstrike is more your standard 2D/3D game with vertical scrolling and loads of enemies flying around in ever increasing complex attack patterns.

This time the setting is Earth, so the game is advanced by the game. On a scale of ingenuity it rates with Green Prosecutor plus, but you can't hurt Ali's make sure the game's not really exciting.

Caution: will also if you... look right, look left...



expect? Just enjoy the joystick and the Frost button.

Frost

Using an "Haven" I can feel "Frost" on the Powerpack below! The last time, but this is the new, improved, you-you-white-blue-but-white "FROST" Turn to "Get animated" page.

100 for Jason Fitch's hot-dog on what's others.

Harrier

Delusions of reality trying to expose how to play a flight sim in one-fifth of a page.

Tell you what - we'll give you a free tip on how to get started when the best thing to do is watch the demo that comes with the game. That should answer most of your questions.



Let your ambitions take flight with Harrier.

To take off, press F to build up your thrust (F) will decrease thrust. When the thrust is sufficient pull back on the joystick to take off. When your stall up in the air, press U to retract your undercarriage.

Use the Frost button of your joystick to forward weapons. For bombs play around with the keys on the top row of your keyboard. Keep your eye on... (ugh...)... the Oscar bit. It's a game, son. It's up to you now. You're... ah... just... just...

NO LOAD ZONE

If you are having trouble loading this month's Powerpack please the staff report a Jiffy flag, stop in a tape-and-tell and send it to: CNET Tech Replacement Service, Attn: Audio Video/CD Removal Department 14, Yahoo! Group 197 428.

Darkest Road (Part 2)

All in all, we present the second and final part of this weekly, fantasy adventure in which you must defeat the evil Black Wizards.

Use F1 to toggle the fonts, while the F2 to F5 keys let you choose different areas with which to accompany your quest.

Apart from that, the game plays pretty much like any standard adventure - in other words, you know what you want to do, but trying to tell the computer is made it can understand it is nightmare.

See, there's all part of the challenge. Let's go!

TAPE TO DISC

This month's Powerpack is also available on disc. To get the disc, version simply tell our folks on the tape (and tell our own view) and/or address on a note of paper, you can hold in an envelope with a return to (postal order, made out to Allen Audio Video/CD Removal Department) and send it to: CNET Tech To Disc, Attn: Audio Video/CD Removal Department 14, Yahoo! Group 197 428.

GAMEBUSTERS

If the Sceptre of Baghdad is becoming a spectre, or Turbo the Tortoise is on a go-slow, Andy Roberts gives you more than a ghost of a chance...

SCEPTRE OF BAGHDAD



POWERUPICK UP!

It's simple logic: ready to give you the games, we create the problems, so it's up to you to give you the answers, lol.

As for what they are, here's the complete solution (going with some extra tips and cheats) for last month's Powerpick spin. Right, how, from the start...

Drop HAMMO for FLUTE, LEFT, LEFT, LEFT, climb stairs, RIGHT, RIGHT, RIGHT, use CLUSTER to get to or OLD LADY, RIGHT, swap

CLUSTER to WINTER BAG, LEFT, LEFT, LEFT, enter door, go down stairs, RIGHT, to use FISH BASKET in POOL, LEFT, LEFT, LEFT, swap WINTER BAG for KEYS, LEFT, to on MAGIC CARPET, enter tower, use FLUTE to climb BRIDGE, climb SHAME (powerups), swap CRYSTAL for WAND, RIGHT, jump up at least, swap HAMMO for WINGS, RIGHT, stand at edge of platform to knock down BEES NEST, enter door, RIGHT, climb stairs, RIGHT, RIGHT, RIGHT,

RIGHT, use KEY on WINDROSE, enter PARROTHOUSE, go down stairs, RIGHT, enter between the trees, swap KEYS for CRYL, to use WIND on WINDMILL, swap WINDMILL for LAMP, UP, LEFT, LEFT, climb stairs, RIGHT, LEFT, LEFT, swap LAMP for NET, LEFT, enter door, go down stairs, LEFT, LEFT, switch ON in NET, L, to on WINDMILL (CARPET), LEFT, use WIND on STATUE, enter where the statue was, DOWN, LEFT, swap CRYL for BROKEN CRYL, RIGHT, RIGHT, RIGHT, swap FISH HELMET for BROKEN CRYL, LEFT, LEFT, enter between curtains, LEFT, RIGHT, to on MAGIC CARPET, RIGHT, swap FLUTE for WINTER BAG, LEFT, to on MAGIC CARPET, LEFT, LEFT, swap WINGS for BUBBLE STAKE, to swap WINTER BAG for MIRROR, RIGHT, enter between bridges, LEFT, RIGHT, to on MAGIC CARPET, RIGHT, enter door, RIGHT, RIGHT, swap STAKE for BRIDGE, RIGHT, enter door, go down stairs, RIGHT, use NET on SPROG, use WIND ON SANDWICH THREAD, LEFT, LEFT, LEFT, to on MIRROR with MIRROR, RIGHT, RIGHT, swap CRYL for MIRROR, climb stairs, RIGHT, LEFT, swap NET for STAKE, LEFT, LEFT, LEFT, swap FISH HELMET for FLUTE, LEFT, to on MAGIC CARPET, enter tower, climb SHAME with FLUTE, climb SHAME, swap THREAD for CRYSTAL, to jump

To go to the "1-UP", use the hidden platform situated to the left. The bonus room can be accessed by pressing down to the right of the peak-up bullet. To reach the second bonus there is a hidden bit, which can be found just to the right of 1. To kill the guardian, wait until it lands and then slomp on its head six times to proceed.



He roars! He jumps! He flies! He swas! 1-UP guaranteed!

LEVEL 3

On this level, the blocks act just like the borders on the previous level (so pick them up and drop them on the water to cross).

The optimum (or whatever) the plan is to avoid them, and ideally monitor, so just avoid them. To collect the "1-UP", take a brick and stand on it to stop TURBO to reach it. Alternatively, jump up from

ACTION REPLAY POKES

Here meet, poke, and downright handy ways to catch POKES with which to, while using the feature. If you're not fully quick to use these POKES, here is the infomurky beginner's course: from the game, press "E" to enter the POKES (press RETURN twice after the last POKES), then press "E" to reset the game. Simply simple.

ONE TO ZERO

POKE 0000170 - Infinite Lives

UNDEAD

POKE 1000100 - Infinite time

TURBO THE TORTOISE

POKE 0000100 - Infinite energy

POKE 0000100 - Infinite lives

POKE 0000100 - Infinite weaponry

LAST POKES

POKE 0000100 - Infinite Lives, level 1

POKE 0000100 - Infinite Lives, level 2

POKE 0000100 - Infinite Lives, level 3

POKE 0000100 - Infinite Lives, level 4

POKE 0000100 - Infinite Lives, level 5

of BIRD, swap STAKE for HAMMO, RIGHT, enter door, RIGHT, swap HAMMO for GLOVES, climb stairs, RIGHT, RIGHT, RIGHT, swap HAMMO, go down stairs, RIGHT, RIGHT, swap HAMMO, to use your position (select "1-UP" game) to continue from level, enter door, LEFT, swap CRYSTAL for ROCK, climb stairs, RIGHT, LEFT, LEFT, LEFT, enter door, go down stairs, LEFT, LEFT, LEFT, to on MAGIC CARPET, LEFT, enter where statue was, DOWN, LEFT, LEFT, swap ROCK for SPIN, swap SPIN for CRYL, swap CRYL for CRYL, RIGHT, to on CRYL, enter between curtains, LEFT, RIGHT, to on MAGIC CARPET, RIGHT, swap GLOVE for FISH BASKET, LEFT, to on MAGIC CARPET, enter tower, climb SHAME with FLUTE, climb SHAME, swap FISH

the monitor's head below.

At the tomb entrance (below a fence and some bushes), enter the tomb to gain access to a bonus level.

To kill the guardian, jump on its head six soon as it surfaces from the ground - it requires eight hits to kill.

LEVEL 4

It's easy (relatively) to stand on the crosses - they act much like the stepping stones from level one. Collect the bonus power, which enables Turbo to fly for a limited amount of time.

Use the springs to reach higher platforms, and note that they can be moved around into more useful positions.

When you reach a dark door near the top of the screen, use a spring to reach it, then go inside to enter a bonus level. Beat the guardian 10 times on the bonus to kill it.

LEVEL 5

When you arrive at the 00000 door in the level, just inside to enter the algorithm bonus level. To kill the guardian, wait until it stops backing then jump on its head six times to destroy it.

LEVEL 6

Collect the second-to-last and fly straight along the top of the screen to reach a corner - this is the key to the bonus level. And simply (it's) kill the guardian 10 times to complete the game.

TURBO THE TORTOISE

(CONTROLLER)

Richard Bennett makes a welcome return to the Games Top pages, this time with a veritable scud of top for this rather clunky platform game. Take it away, Pokes...

LEVEL 1

When you reach the life pool of water, fall left from the platform on the right. This lands safely on a hidden platform, allowing you to go left and collect the power.

Press down at the second cave entrance to enter a bonus level. The stepping stones work, so be sure to jump off them very quickly. On the second horizontal moving bit, wait to avoid the platform wobbling you down.

To reach the "1-UP" power up, there is a hidden ledge to the right which will aid you down.

To kill the guardian, jump in the centre of its head four times (be careful not to hit its arms, though).

LEVEL 2

Pick up boulders and drop them on the water to cross the gap, since they act as life-lines. They touch the water.

To reach the platform above the two boulders, there is a hidden platform above the right-hand walking (climb) enough.



Three-for-all

You've read the preview, and you've played the coverlapse demo, now the latest Visualize game has arrived. Andy Roberts looks carefully at the latest in a long line of Defender variants.

DEADLINE

It all begins in the year 2084. You wake up aboard an alienation ship and drop into space to examine a planet not entirely unlike Earth, along with its three orbiting moons (each also up down 8:1 - 0:3).

Four teams, consisting of between five and 20 scientists, were sent down to each of the four planets to sample, probe, and monitor whatever they found.

Everything was peaceful and fine day, as a common with deep space exploration, radio-contact with one of the teams was cut. With no time to draw up emergency back-up contingency plan B, radio contact with the other teams was also lost. Cut wires and dramatic music, in reality, the men were being attacked by a multitude of aliens and many were killed as they ran for the safety of the teleport bases. They soon discovered that by hiding in the water and remaining motionless, they could avoid detection by the aliens. It is your task, your mission, and your duty to board your Tracer craft and attempt to rescue the scientists from almost certain doom.

Deadlines set against a beautiful, notoriously scrolling backdrop, which boasts some incredibly effective parallel play. Taking control of the Tracer CRT, you must traverse the landscape dodging



The Tracer sees and the ship - in Deadline

anything above the water while evading any scattered shaped objects in the water.

The Tracer has an instant laser cannon, which allows you to deal with even the most thick of alien life forms, and is fast enough to outrun even the wildest of earth/inhabitants. Once you have spotted a white oval in distance, releasing the firing button isn't much simpler. Just move the Tracer along the creature's head, at which point a small target appears to aid your vision, then drop them as far as possible to teleport them into your ship. Once collected, each scientist must be taken to the ship's teleporter, where you simply drop down onto the landscape to save the scientist to the safety of the coping municipality.

Burns Deadline is inspired by Defender, and Defender, but that's not to say that it isn't just something new to the genre - it does... Just.

The alien in this particular game aren't trapped in to the landscape, and as such are completely motionless. This makes every game no matter how proficient you may be for a very different experience. As the aliens fly aimlessly across the landscape, the fastest chase generates a superb atmosphere, especially if you also have one scientist to rescue and one life to do it with. Thankfully, small bonuses appear from time to time, which clear the screen (at least for a brief moment) and allow you to breathe a little.

TRACER

As an added bonus for anyone who buys Deadline, the author has included another of his games, Tracer. Tracer is the unofficial prequel to Deadline, indeed they feature the same main ship, called a Tracer (in the artwork).

However, that is where the similarities end.

Tracer is a state-screen shoot-'em-up, no lives, no boss, and no filler effects.

Each screen, set against a gorgeous backdrop, contains a myriad of enemy sprites, varying around in traditional multiplier fashion. You must clear each screen before the time limit runs out. If you're successful, you move on to the next screen, along with a fresh time limit... This continues until you either



It run out of lives or, better, out of time.

In most cases, you run out of lives. You see, Tracer is initially very frustrating. The time limits seem ridiculously short, the attack waves impossibly complex, and your bullets

unbelievably slow. But once your brain and trigger finger begin to work in harmony, you discover a 'pattern' to the attack waves, and you'll progress a little with each subsequent try.

Tracer is an excellent little shooter, with neat presentation, plus a choice of four tunes to listen to. Heckler's not the greatest shoot-'em-up on the CRT, but as a freddie it warrants special attention.

DEADLINE

PRICE: \$1.99

FORMAT: TAPE AND CD-ROM

FROM: Visualize, c/o Phil Robinson, Rayburn, Chesquers Lane, Eversley, Hants RG27 0WY.

OTHER INFO: Cheques and postal orders payable to Phil Robinson.

DYSTOPIA

With the disc version of Deadline you also get a free copy of Dystopia (in addition to the superb Tracer). You may well recall the game (DYS/08/04) released in C&A, or even the original DYS/08/04 demo which made its appearance a couple of years ago.

Dystopia, the game, is a simple two-player affair, the sort of thing bored programmers knock up over particularly rainy weekends.

The basic premise goes like this: the action takes place at the bottom half of the screen with each player controlling a small ship. In between the ships is a barrier, which moves up and down at a varying rate. You can't move past this barrier, and so the aim of the game is to kill your opponent (while dodging his or her bullets) and earn points. The player with the most points when the time limit reaches zero wins.

Dystopia is a simple concept, and is,

surprisingly, great fun to play. There are some nice graphics, too, along with even more clever music by Chris Lightfoot.

As a stand-alone game,

Dystopia would rank as

average. But it isn't, and it's great.

RANK
75%

The most fun action is complementary (after the standard) by the robot set-up side of the scenario, indeed it is possible to spend some 30 weeks which only require you to rescue a handful of scientists. Perhaps the only drawback is the lack of diversity - each level, although a little different, doesn't offer anything substantially new or challenging for the player. The opening game, it seems, should survive a little more.

Now Deadline wouldn't normally rank as anything special, it comes at a time when new releases are, fairly, as rare as a state still attached to the UK. The graphics are neat, colourful, and well done, and there are some superb tunes to accompany the action. Add this to a ridiculously low asking price, and you'll be doing to spend it. Until you see it you won't buy it. (Defender, for you'll be hard-pressed to find three better games for under £2.50 in your youth!)

UPPERS

- Spectacular introduction sequence
- No fiddly multiloading nonsense
- Two great freebies - Tracer and Dystopia
- An absolutely bargain price

DOWNERS

- Gameplay can become repetitive
- Some colour schemes are lacking
- Concept lacks originality

RANK
90%

TRUE ROM-ANTICS

**How do you SAVE?
Don't ask Peter
Shilton, ask
Jason Finch...**

This month we round off the routines that are used to simply loading and saving. Last month we looked at the ROM routines for setting up a file and for specifying a filename, together with that for loading a file from tape or disk. The opposite routine, that for saving a file, is less the month and we are also looking at an error routine. Errors can be generated by the loading and saving routines so it is important that you know what they mean and how to sort out any error that occurs.

SAVE

Routine name: SAVE
Function: Saves file to a device
Call address: \$FF08 (\$D400)

Parameter passing: Accumulator, X and Y index registers
Prerequisite routines: GETFILE, GETNAM
Error reports: 5, 6, 8, 9, \$E400-\$F



Stack requirements: None
Registers changed: Accumulator, X and Y index registers only

Description: The SAVE routine should be used when you want to save a section of memory to tape or disk. It is the same routine that is used by the BASIC SAVE command, the only difference is the whole procedure is that you must set up the parameters yourself. Any area of memory can be saved so long as you specify the start and end addresses. The SETUP and SETNAM routines must always be called prior to the SAVE routine to ensure that the file is open and that a filename is specified. Even when working with tape where a filename is not necessary, you should call SETNAM after setting the accumulator to zero. This ensures that the computer is aware that you do not want a filename to be used. An error will be generated if a filename is reported but you don't give one. The start address of the save must be stored as a vector in one page. In other words, you could use two consecutive locations like \$FB and \$FC (\$E1 and \$E2) as your own vector. You

store the start address in these locations in the normal/high format. The accumulator must then be set to the actual location number of the vector. In other words, here you would set LDA #FB and not simply LDA \$FB. The latter would only load the contents of location \$FB into the accumulator, not the number \$FB. Once that has been done you should set the X and Y index registers to the address of the first byte after the end of the block that you wish to save, again in/high format.

Example: You want to save the area of memory \$C000 through to \$C3FF inclusive to tape with no filename. You decide to use one page \$FB as your vector for the start address. The mainline after the end of the block you wish to save is \$C3AA.

```

LDA #1
JMP SETUP
LDA #0
JMP SETNAM
LDA #C000:4-$FB
STA $FB
LDA #C000:4+$FB
STA $FC
LDA #C3AA:4+$FB
LX1 #C3AA:4+$FB
LDA #FB
JMP SAVE
    
```

NEXT MONTH

Reading and setting the cursor position, together with a few other time-consuming ROM routines will come under the spotlight next month. After that we return us to the heavy stuff so get your next issue on the ready.

DEALING WITH ERRORS

READST

Routine name: READST
Function: Reads the system status
Call address: \$FF07 (\$D300)
Parameter passing: Accumulator
Prerequisite routines: None
Error reports: None
Stack requirements: 2
Registers changed: Accumulator

Description: You may have heard of the BASIC variable ST which is set for \$TXSTEL. I hope you know, the READST routine is the machine language equivalent of finding out the current status of the input and output devices; in other words, finding out what ST is currently set to. You should call this routine after you have accessed an IO device in some way or other. An IO

Figure 2

NUMBER	DESCRIPTION
0	STOP key pressed
1	File not open files
2	File already open
3	File not found
4	File not open
5	Device not present
6	File is an input file
7	File is an output file
8	Filename is missing
9	Illegal device number

device. This routine could be used to check the file and so on. You can see from Figure 1 that, during a tape read routine, bit 2 will be set when the end of the file has been reached. The value 84 in the example is taken from the

decimal value column of the table.

```

JMP READST
AND #4
BNE EOP
    
```

OTHER CODES

Some other routines generate other errors. These are not detected by the READST routine and are shown throughout this column as numbers in the "Error Report" line of the routine descriptions. If an error occurs, the carry bit will be set and the number of the error message will be stored in the accumulator. You should have a standard routine that deals with errors by clearing them all open channels and files and then reporting the error on screen. Follow all relevant ROM routine calls with a BCC ERROR instruction and this will sort things out. The error codes are shown in Figure 2.

Figure 1:

BIT POSITION	DECIMAL VALUE	TAPE READ	SERIAL DEVICE	TAPE VERIFY AND LDA
0	1		Timed out writing	
1	2		Timed out reading	
2	4	Short block		Short block
3	8	Long block		Long block
4	16	Unrecoverable read error		Mismatch
5	32	Checksum error		Checksum error
6	64	End of file	EOP line	
7	128	End of tape	Device not present	End of tape

device could be anything like the tape \$D6A, a disk drive, a printer and so on. If any errors have occurred, READST will let you know. If there are no errors, the routine will return with the value zero in the accumulator. Otherwise, the different bits tell you what has gone wrong. Figure 1 shows the relevant values that could be returned.

Example: You are reading in a file one byte at a time and want to branch off to another routine when the end of the file has been



Well 'ard III

RAMLink is a power-backed, expandable RAM-based disc drive which can only be described as revolutionary, says Russ Michaels. So, it's make-your-mind-up-time for the rest of us.

RAMLink is more than an RAM expansion unit (REU), or a power back-up. It employs the latest technology and has a reliable operating system which is packed with features that enable you to store data at 500 times faster than you can using a 5.25".

Probably the most important feature of RAMLink is its built-in operating system, RL-DOS, which originates from the DOS used in CMO's hard-drive. RL-DOS actually creates a RAM-based disc drive which is fully partitionable. (Partitions are a way of organizing large amounts of memory by breaking it up into smaller segments.) As with all CMO storage devices there are several partitions to choose from:

- emulation mode partitions that mimic 5.25", 10.5", 15.25" drives; and
- the most versatile, native mode partitions, which range from 256 blocks to 1536 and incorporate SEEDOS style sub-directories.

Compatibility

Since RAMLink is seen as a standard drive on your system or your system and accepts all standard Commodore DOS commands, you can use it with much more software than other RAM devices. This same compatibility makes it easy for you to start using RAMLink right away.

The unique SWAMP button allows you to easily exchange device numbers with your current floppy drives using device numbers eight or nine. This is very useful indeed, and allows you easy access to RAMLink when using a program with limited device number support.



Back to the USA, RAMLink—making SEEDS better.

Operating speed

Because RAMLink is essentially a disc drive inside a RAM it operates very quickly. Data delivery speeds up to 30 times faster than a 5.25" REU and up to 500 times faster than a 10.5". You load and save programs at such an amazing speed, and access data so quickly, that you get impatient when you need to use floppies.

Utilities

You get several simple programs with RAMLink. These allow you to easily create partitions and sub-directories, to copy files and whole files, and software for GEOS compatibility.

Then from what you have read so far you are probably thinking RAMLink is just another disc drive,

right? Wrong! Even though your system sees RAMLink as a drive you can still access the memory directly either your own programs, transferring data between CMO and RAMLink, copying floppies, and so on, as you would with other REUs. However, because you are able to send disc commands to RAMLink this makes the process faster and easier and makes it possible to get the most from your RAMLink and adapt your existing programs even if you have any limited programming knowledge.

If you question your PC and Amiga writing friends, for example how their games can save RAM, you find a reference to setting up a RAM disc. You can say:

"Well, my RAMLink is a permanent RAM disc that accepts DOS commands as soon as I switch-on. There is no additional software to be loaded up, no configuration file... and so on."

Then you smile while remarks they "well to say about your humble CMO. How long out of fat they want even understand what a RAM disc is let alone how to use one!"

GEOS

RAM disc transforms GEOS into a much faster and more usable environment, and so other RAM devices drive the PC faster than RAMLink. Use the CMO Goodwill card utility and you have instant access to all your GEOS applications. You can even load GEOS directly from RAMLink in seconds.

Autobooting

RAMLink's unique auto-boot feature allows you to load any program from any device as soon as you switch on your computer - you don't have to enter a single command - if you have a C128 you can even define separate auto boots for both 128 and 64 modes. Very useful, and the minimum of fuss, just what a hard-core user on should do.

NEXT MONTH

Check out the latest technology from Germany, the FL484.

an 8MHz speed upgrade card for your 64 with 1MB of on-board RAM and a 1000 CPU. Yes, you can upgrade your 64 for the speed and power of an Amiga. But will it take over? Or do you mean that really? - Ed J. Jason Fresh introduces you to error reports and saving a file to either tape or disk.

Additional features

RAMLink also has two extra ports:

- a RAM port for connecting additional REUs such as Commodore's Turbo series, or GEORAM, which increases RAMLink's independent power supply and battery back-up, can continue to hold data when your computer is switched off.

- a game through port which can be used with many commercial cartridges and interfaces such as Action Replay or games.

RAMLink also has a parallel port to provide parallel access to CMO HD series drives, making it capable of transfer speeds far greater than any other drive ever available for the Commodore. A version of

the JiffyDOS kernel is also built into

RAMLink which makes re-loading frequently used commands easy and convenient. It also allows you to take advantage of any JiffyDOS equipped disc drives hooked up to your system.

RAMLink is the name of the original expansion board used to transfer RAMLink into its own self-contained RAM drive. RAMWare has four industry standard 512KB sockets each capable of holding either a 128k or 512k 512k for capacities of up to 1536k making the upgrading to RAMLink simplicity itself for the user. And of course, the end result is power, speed and flexibility.



GET Animated!

Animating and displaying sprites on the screen is easy. Jason Finch uses FROST to set free a small, green character who, until now, has been frozen in time.

Sprites appear in the most unexpected of places. In your bathroom, under the bed, and even on your computer screen.

Maybe you haven't got a clue what a sprite is. Maybe you thought I was talking the truth about sprites under the bed. Well a sprite is often called a Mosaic Object Block by the experts. This is because it's an object on the screen and is defined with a certain small block of squares and, last but not least, it's called that because it's movable. However, I'll stick to calling them sprites.

Sprites are small graphics that you can create yourself and, within the limitations of BASIC, you can have up to eight of them on screen at a time.

You can have up to eight sprites on screen at a time

If you know nothing about sprites, turn around in back issues of EP and check out your manual and then come back and find out about animation. On this month's *Powerplay* (see also page 8) you find an updated version of my FROST program. *Powerplay's* Really Original Sprite Things. You may have seen it back in QPS. However, it's more again, debugged, and ready to enable readers to design sprites. Use a *QWERTY* in port two and the menu bar along the top.

Building confidence

The first thing to do is get FROST up and running. In case you're not quite sure where you're in the editor, the screen should look pretty much like that in Figure 1. When you do get to that screen with the big yellow star at 4, clear the grid. The easiest way to do this is to hold down **SHIFT** and tap the **DELETE** key. This will a label for FROST, either so it'll assume you've got to play with that, too.

To make sure you're dealing with pointer 128 (PNT8 should read 128 on the right of the screen), change the sprite colour to pink and start drawing the roof of a house with a chimney. Make sure that it looks exactly like the one at the top of Figure 2. This means make sure you count the right number of squares across before putting the chimney in and things. I'm not going to allow you any free artistic licence with this one. Then comes last. Now add the walls and leave some holes for the windows and door as shown by the picture at the bottom of Figure 2. Refer to your completed house as House P name 1.

You have now defined sprite 128 to look like a cute little pink house. How sweet. The information for this sprite is stored in the 83 bytes from location 8192 onwards, because that is the start of the 128K set of 84 bytes in the computer's memory (20754-8192). Now, leave FROST by entering **QUIT** from the **PROJECT** menu, or hit the **Q** key.



And what a character for it.

To see the

screen, clear the house, clear the screen and enter **POKE 83248, 150:POKE 83249,148**

to position sprite zero at (150,148), then enter **POKE 83248,128** to say 'Okay, sprite zero should take on the look of the 128th sprite in memory'. Also do **POKE 83287, 10** to make sprite zero pink and then with a quick **POKE 83288, 1** you'll see the house appear on your screen.

FROST bytes

With the top in one hand, enter **PRINT 80000** with the other to get back into FROST. You should see your big pink house again on the grid. Now move to the next sprite so that the value under **PNT8** is 129. You can do this by using the menu bar or by pressing the **4** key when the small box is flashing inside the top grid.



1 Okay, so it's just a star. What do you expect in the start?



2 There's the roof of the house. All right!



3 The house looks like it's done.



4 The conditions for the house, now, you define.



5 Don't panic, it's just a screen. Fear's not.



6 And here's the green little house, though.

note that key presses only work when you are in the grid, editing a sprite.

Copy sprite 128 to sprite 129 so that you now have two versions of the same house: one with pointer value 128 and the other with pointer 129. If you don't work but how to copy sprites that update the house. Fit in the windows so that the house looks like the one shown in Figure 3. This is Mouse Frame 2. By looking between the two definitions of pointer 128 and 129, you see a house where the lights in the windows go on and off. Okay, so technically it's actually that the windows are being bricked up, but say it's the lights going on and off. The computer won't know the difference. Out FROST again.

The windows are being bricked up, but say it's the lights going on and off. The computer won't know the difference

When you return to Basic from FROST, the screen should be restored to the way it was when you last entered FROST (perhaps one of its most useful features). So you should still have Mouse Frame 1 on the screen, a little girl house somewhere near the middle. Enter POKE 2040,128 and the house changes to Mouse Frame 2. Enter POKE 2040,129 and it changes back. Amazing. It's animation. Now try this:

```
10 POKE 2040,128
20 FOR T=1 TO 100:PRINT T
30 POKE 2040,129
40 FOR T=1 TO 100:PRINT T
50 GOTO 10
```

Now you're amazed and impressed. You have your very own version of the start of that great Don't Forget Your Cupboard game where you see everything bricked down in a living board out of the bathroom window.

You see, you change the definition of sprite zero. You don't put another separate sprite on the screen. This is an important concept and you must understand

it before you can figure out what is occurring. But, generally, that's all there is to it.

Now something more complicated... Building up a program to animate the house and another character.

Reel animation

An animation is a bit like a film reel. It's a number of images flicked before your eyes very fast to give the illusion of movement. For our purposes you have characters, a bit like a cartoon or television. Each character has a number of frames of animation. That house you see back there had just two, but a character that walks may have many more than that. All you do is flip between these frames and then back to the first one and keep looping around that.

If you move the actual position of the sprite at each frame you give the illusion of walking, or whatever else you want to do with them. You could have a bomb springing round as it goes to the ground or a focus star twirling in a dip. The objects themselves don't matter, it's how to do the animation that's important. In a few moments, if you can control your environment, you define a character known as Leonardo Green Pea.

Moving the actual position of the sprites gives the illusion of walking, or whatever else you want to do with them

He has six frames of animation which gives the illusion of a walking to the right. This green, fat's a pea, and he's about to land on your computer screen.

Peas and Qs

Go back into FROST by entering SYS 88888 and move to sprite definition 128 (PNT#128). Do you want to clear the image? Ok so if you have to and change the sprite colour to light green. Now draw a little top hat in the top left corner of the grid. Now you make track exactly like the one shown in the top of

Figure 4 if not so do it. Now add the body, with eyes and mouth, as shown by the assembled at the bottom of Figure 4. Does your Leonardo Green Pea look exactly like that? If not, I'm not playing with you.

When 14 Green Peas is complete, except for legs, go to the next sprite (PNT#129) and copy sprite 128 to that area. Do the same for pointers 130, 131, 134 and 135. Use the ← key to go backwards through the sprite definitions to ensure that you now have four identical Green-Pea bodies. These are the Green-Pea frames of animation. Frame 1 (PNT#128) through to Frame 4 (PNT#135). The sprite pointer values don't matter much; you could equally have put them in Frame 4 at 900 or something, but this makes sure my program works on my computer.

Right then, you now need to go to each one and add the legs. To make it look as if he is walking, you change the legs slightly in each frame of animation. Check out the images in Figure 5. Your frames should look exactly like those. Note that Pea Frame 5 (PNT#134) has the hat and body shifted down one pixel within the grid. To do this, before adding the legs, hold down SHIFT and tap the D key. This gives the hat the cute look of bouncing along as he walks.

Hold down SHIFT and tap the D key. This gives him the cute look of bouncing along as he walks

Check out the ANIMATE option under the SPECIAL menu. Enter the values 128 for the start sprite and 128 for the end sprite. You should see your little Green-Pea start to move back. (Pretty nice, isn't it?) Press RESTART to return to reality. When you have done all that you should see FROST, now REW to get rid of any programs in memory, and then settle down for a quiet bit of animation programming.

Start the take

Let's look at a bit of programming and see you would start things rolling. Type in the BASIC program below



7
That's
better.
The
before
and
after
to
walk
on
more.



8
That
looks
like
he's
walking
around.



9
That
again...



10
That
again...



11
That
again...
(There's
lots
of
this
in
animation)



12
Yes, that
again...
plus
all
the
walking
frames
together
and
the
body!



AND RUN it. You should find that the screen starts moving you up and up with a pink house in the bottom-right corner of the screen and a Green Pea looking indignant on the left of the screen somewhere about halfway down. In its state, he should be light green. You can make him less green if you really like, but I wouldn't bother too much.

```
108 MOVE MOVE20 MOVE20 MOVE 21 21 20221
118 MOVE MOVE20 MOVE20 MOVE 22 22 21211
128 MOVE MOVE 2040 2040
130
140 MOVE MOVE20 MOVE 2040 MOVE 2040 MOVE 2040
150 MOVE MOVE20 MOVE 2040 MOVE 2040 MOVE 2040
160 MOVE MOVE20 MOVE 2040 MOVE 2040 MOVE 2040
170
180 MOVE MOVE20 MOVE 2040 MOVE 2040 MOVE 2040
190 MOVE MOVE20 MOVE 2040 MOVE 2040 MOVE 2040
200 MOVE MOVE20 MOVE 2040 MOVE 2040 MOVE 2040
210 MOVE MOVE20 MOVE 2040 MOVE 2040 MOVE 2040
```

Now does the program work? Well that's just simple sprite stuff. The first 1 is a simple sprite, more about animation, but lines 110-130 set up the screen, line 140 defines the position of sprite zero and line 150 defines the position of sprite one. The MOVE MOVE20 in line 160 puts sprite zero on the right-hand side of the screen. This is the most significant byte (8bits) of the screen's horizontal position and anything over 255 means you need to set it. It works in a similar manner which means that the one on location in memory (00204) controls the MOVE for all sprites, so if for sprite 0, set for sprite 1 and so on. Line 160 sets the colour and pointer value for sprite zero, and line 190 does the same for sprite one. Line 200 resets the vertical and horizontal expansion settings, just in case, and line 210 switches both sprites on.

You could change this to MOVE MOVE20 1 2 if it makes you feel better! Each sprite has, if you like, a code number. Sprites zero is coded 1, sprite one is coded 2, sprite two is coded 4, sprite three is coded 8, four 16, five 32, six 64 and sprite seven is coded 128. This is binary and you should understand it. However, if you don't, just use those code numbers. So if you wanted to display sprite one, three and five, you would add the code numbers which are 2, 8 and 16 to get 2+8+16=26. Then MOVE MOVE20 26 includes those three on. The code for the MOVE register at location 00204, is for the vertical and horizontal expansion registers at 00211 and 00212.

Lights!

Let's animate the house. Add the following lines to the program and then RUN it again.

```
220
230 MOVE MOVE20
240
250 MOVE20 MOVE 2040
260 MOVE MOVE20 MOVE 2040 MOVE 2040
270
280 MOVE MOVE20 MOVE 2040
290 MOVE MOVE20 MOVE 2040 MOVE 2040
300
310
320 MOVE MOVE20 MOVE 2040
330 MOVE MOVE20 MOVE 2040 MOVE 2040
340 MOVE MOVE20 MOVE 2040 MOVE 2040
350 MOVE MOVE20 MOVE 2040 MOVE 2040
360 MOVE MOVE20 MOVE 2040 MOVE 2040
370 MOVE MOVE20 MOVE 2040 MOVE 2040
380 MOVE MOVE20 MOVE 2040 MOVE 2040
390 MOVE MOVE20 MOVE 2040 MOVE 2040
400 MOVE MOVE20 MOVE 2040 MOVE 2040
```

So what does that do for us? Well you set some variables in line 220. This is House Frame and House Speed. They are both counters. The sub-routine at lines 1000-1050 is what does the lights. You enter it and add one to House Speed at line 1010. If it hasn't reached the value 4 you go down to the next program. If it has, then you reset the counter and add one to the House Frame counter. Line 1000 checks to see if you have done all the frames and, if you have, the counter is reset to zero. Line 1040 then adds the Frame Counter to the pointer value of the first frame on this code (10) and stores that number at the sprite pointer location for sprite zero (location 0020).

Change the IF HS=4 THEN 1050 and the lights blink on and off in the house a lot slower because you only animate the house every tenth time you call the routine

If you change the IF HS=4 THEN 1050 to something like IF HS=10 THEN 1050 the lights blink on and off in the house a lot slower because you only animate the house (change the frame) every tenth time you call the routine.

Let's add some more bits... Change lines 220 and 230 to these:

```
220
230 MOVE MOVE20 MOVE 2040 MOVE 2040
240 MOVE MOVE20 MOVE 2040 MOVE 2040
250
```

Now you've added some

0040s for the 13 Green Peas. We have Pea Frame and Pea Speed counters. Add the animation routine as you did before:

```
260 MOVE MOVE20 MOVE 2040
270 MOVE MOVE20 MOVE 2040 MOVE 2040
280 MOVE MOVE20 MOVE 2040
290 IF HS=4 THEN 1050
300 IF HS=4 THEN 1050
310 MOVE MOVE 2040 MOVE 2040
320 MOVE MOVE 2040 MOVE 2040
330 MOVE MOVE 2040 MOVE 2040
340
```

You've got the same sort of routine, butting much has changed apart from you are using PE and PF instead of HS and HF. It all works the same. 13 Green Peas is animated more quickly because he changes every second time you call the routine. He has six frames of animation and therefore his 2000 checks IF PF=4 THEN means the code equivalent was IF HF=4 THEN which is quite sensible.

Action!

Okay, so that program in Green Pea is moving walking again. Not a good sign. You need to get her

WINE WINE WINE

You're seriously into Commodore animation, you could do a lot worse than have a look at the results. The professionals get. And what better example than the winner of our Electric Blue? They've got the five copies of this incredible 30 pin colour-changing game to send out to the five winners of this competition.

Simply answer the questions below on a postcard and send it to Commodore Competition, Commodore Format 30 Magazine St, Brixton, South East, SE16 5PU. It's got to arrive by May 15th, and good luck. Please specify type of disk.

6. Electric Blue are based in Surrey - but in which town?

moving across the screen. This means you need to change the horizontal position sometimes to give the illusion that he is walking. Change line 200 again:

```
200 MOVE MOVE20 MOVE 2040 MOVE 2040
```

Now add the following two lines to the animation

```
routine
2041 MOVE MOVE 1120 MOVE 2040 MOVE 2040
2042 MOVE MOVE 2120 MOVE 2040
```

Now you have set up a variable called PE which is Pea's position. The starts off at 20 because you've set the code that with MOVE MOVE20 in line 160 so it is quite a good idea to make PE=20 in line 230.

The same two lines in your animation routine add one on to the horizontal position of Green Pea every time he is animated. When he reaches a sufficiently high value of PE (in this case, one greater than 255) he returns to the left of the screen and just walks across again.

This is done for simplicity only. You could get him to walk at the top across the screen by setting the MSB. Line 2042 just

moves the new horizontal position (PE) at the location in memory that deals with the horizontal position of sprite one (00204). If you want him to move further each time, change the PE=PE+1 to PE=PE+4. However, you see the mess that took all though he's having across your display but I guess. You can reduce darkness if you like so that PE=PE+0.04 and you get it looking really realistic.

Peas release me...

You've created animation, you taught your sprites and you link quickly between them to give the impression that they are changing. Well, they are changing, but you know what I mean. Move them around and people will think this little character is actually walking. You could make another set of six sprites by copying the Green Pea horizontally in each Pea Frame using MOVE20. Change things and you can make him look at though he's walking to the left instead.

The rest is time up to you. You can do some use built-inout sprites, expanded ones, or whatever you like. You give you the building blocks and now you must go away and experiment. So, put on your goggles and have the best tubes at the ready.

BUY-A-RAMA

Broadcast it, barter for it, bring it or blather about it. The vital C64 smart mart starts right here.

WANTED

C64 BBT amateur radio software on disk please. (Must run on Atari Model 130) also wanted C64 to any system store. Buy any price. All in Ontario. Brian David Finkler, Lehigh, Ohio, South West 24 H 882.

Safety Launch home radio also any price. Jason W 66 464 (214) 668 (Miss Missouri).
Microbarcode for sound sampler and expander and good quality sampler. Must be fast drive. Ken Beck, Redwood, Wis., 24 Borough Plaza, Ocean View, Delmar, "C64-80".

Experienced on disk for C64, Richard Williams, 4 26671 Stratford Road, Portland OR 97226.

Urgently wanted C64 compression compatible with all interfaces. Brian-John, Office #4 7182-1122-2626.

Software wanted for new PC game. Catalogue can be ordered at the same address. Peter Reuss, 26 Placent Rd, 1605 Mt. Rogers, Netherlands.

Originally wanted CP64, 640K* have overpriced 100K-250. Gino, 24-18800 Craig, (Seattle) south Alaska, Whitehorse BC Y0A 3A5.

Double-D 640K disk/300-400, 300000 Express system, Andy Smith, 40 Glenview Park, Wakeley, Massachusetts 01826.

Must have (reason 128K printer, disc drive, Turbo Star, 400K/256K C64, 120K, 160K, 256K) Coast Road, Forest Hill, London E1 7JL.

Replaces but from French (Chap) 128K, Advanced Flight France in Switzerland.

Anything compatible. Deal 21 2261 Brady St. Hyde 961 6195.

Time Machine (international) Asteroid and Magic Crystals (Microvision), Mitchell/McIntosh, Alton Towers, Stoke-on-Trent ST7 5AS England.

Designed for and tape for C64, Stuart Fuller, 18 Madbury Road, Brighton, 5/Over 193 826.

Photocopying games. Also originate only 20 per game. Also wanted strategy games, especially arcade fiction.

Alan W 19 736 926-43.

Urgently wanted Rochester from Program 2200. (Most wanted) but all computer tapes. The Martini/Puzzle games. Tony, 41 Rowland, Bathmore, Stone, Bristol BS7 1LP.

C64 with or without drive. Preferably with some utilities/software (no donations or swaps). Anthony 1496 to no. 20 Springfield Lane, Ipswich, Suffolk IP1 3BP.
C64 drive alternative any games or blank discs. David W 24422 24 7160. 1600/4000 available prices.
Need on your new time games? Don a disc drive and C77. Able to do no information display. See program at 3 Tringale Max, Paul, Penance, Cornwall TR10 3JL.

Help! need more. To 21 Summer with 500K, 600K, 700K, 1200K, 1800K, 250K. Chris W (077) 1899. Newcastle upon Tyne.

Swapping (to/disk) plot boards and mouse mat. 160 page 10.50 on any page letter 1.13. David, 16/18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250.

Wanted C64 swapping and trading games, demos and any wants. Stephen May, 146/150 Aylesbury Road, Oynon, O.U.E., Aylesbury, 2593 (Hemel Hempstead).

400K 8000 equipment for repair (no price paid) 26 11 21 227 1588 8-18pm.

Printer or parallel (C64) (currently closed with manual and books. Based price for C640 computer. 24 11 227 1588 8-18pm.

128K 2500K 3200K with disks, disks and manual 3200K. 3200K/2500K wants 24 11 227 1588 8-18pm.

C64 games for sale 24 11 227 1588 8-18pm.

Printer 2400 8000/8400 (light hit) 24 11 227 1588 8-18pm.

Wanted C64 supply for Commodore. Agency 15000000 stock number 444329 38. Any reasonable price considered.

3200K 3200K/2500K 3200K 3200K/2500K 24 11 227 1588 8-18pm.

Commodore 64 (100) disk. Must be in good working order. 1600/4000 printer and printing 10 153 25 153 25.

FOR SALE

Good games from C64, Tapes C64. Send the details of requirements. 100 to my house to reply promptly with your responses. Barry in phone 19 1 276049, 2 1900536.

Football, Lincoln, 24 South West 24 11 24 24.

2000, 4000, 8000, 16000, 32000, 64000, 128000, 256000, 512000, 1024000, 2048000, 4096000, 8192000, 16384000, 32768000, 65536000, 131072000, 262144000, 524288000, 1048576000, 2097152000, 4194304000, 8388608000, 16777216000, 33554432000, 67108864000, 134217728000, 268435456000, 536870912000, 1073741824000, 2147483648000, 4294967296000, 8589934592000, 17179869184000, 34359738368000, 68719476736000, 137438953472000, 274877906944000, 549755813888000, 1099511627776000, 2199023255552000, 4398046511104000, 8796093022208000, 17592186044416000, 35184372088832000, 70368744177664000, 140737488355328000, 281474976710656000, 562949953421312000, 1125899906842624000, 2251799813685248000, 4503599627370496000, 9007199254740992000, 18014398509481984000, 36028797018963968000, 72057594037927936000, 144115188075855872000, 288230376151711744000, 576460752303423488000, 1152921504606846976000, 2305843009213693952000, 4611686018427387904000, 9223372036854775808000, 18446744073709551616000, 36893488147419103232000, 73786976294838206464000, 147573952589676412928000, 29514790517935282584000, 59029581035870565168000, 118059162071741130336000, 236118324143482260672000, 472236648286964521344000, 944473296573929042688000, 1888946593147858085376000, 3777893186295716170752000, 7555786372591432341504000, 15111572745182864683008000, 30223145490365729366016000, 60446290980731458732032000, 120892581961462917464064000, 241785163922925834928128000, 483570327845851669856256000, 967140655691703339712512000, 1934281311383406679425024000, 3868562622766813358850048000, 7737125245533626717700096000, 1547425049106725343540192000, 3094850098213450687080384000, 6189700196426901374160768000, 12379400392853802748321536000, 24758800785707605496643072000, 49517601571415210993286144000, 99035203142830421986572288000, 198070406285660843973144576000, 396140812571321687946289152000, 792281625142643375892578304000, 1584563250285286751785156608000, 3169126500570573503570313216000, 6338253001141147007140626432000, 12676506002282294014281252864000, 2535301200456458802856255728000, 5070602400912917605712511456000, 10141204801825835211425231112000, 20282409603651670422850462224000, 40564819207303340845700924448000, 81129638414606681691401848896000, 16225927682921336382280377792000, 32451855365842672764560755584000, 64903710731685345529121511168000, 129807421463370691058243022336000, 259614842926741382116486044672000, 519229685853482764232972089344000, 1038459371706965528465944178688000, 2076918743413931056931888357376000, 4153837486827862113863776714752000, 8307674973635724227727554429504000, 16615349947271448455455108859008000, 33230699894542896910910217718016000, 66461399789085793821820434436032000, 132922799578171587637640868872064000, 265845599156343175275281737544128000, 531691198312686350550563475088256000, 1063382396625372701101126950176512000, 2126764793250745402202253900353024000, 4253529586501490804404507800706048000, 8507059173002981608809015601412096000, 17014118346005963217618031202824192000, 34028236692011926435236062405648384000, 68056473384023852870472124811296768000, 136112946768047705740944249622593536000, 272225893536095411481888499245187072000, 544451787072190822963776998490374144000, 1088903571444381645927553996980748288000, 21778071428887632918551079939614955776000, 43556142857775265837102159879229911552000, 8711228571555053167420431975845982304000, 17422457141101103448440863551691964608000, 34844914282202206896881732503383929216000, 69689828564404413793763665006767858432000, 139379657128808827587527330013535716864000, 2787593142576176517550546602267141332288000, 557518628515235303510109240453428264576000, 11150372570304706070202184809068565312000, 22300745140609412140404369618137130624000, 446014902812188242808087392362742613248000, 892029805624376485616174687525485224768000, 178405961124875297123234937505097049536000, 356811922249750594246469875010194099072000, 713623844499501188492939750020388198144000, 1427247688999002376985879500040776396288000, 285449537799800475397175900008155279328000, 570899075599600950794351800016358558656000, 1141798151199201901588703600032717111392000, 2283596302398403803177407200065434222784000, 45671926047968076063548144001308684455552000, 913438520959361521270962880026173691111104000, 18268770419187230425419256000523473822222000, 36537540838374460850838512001046946444444000, 73075081676748921701677024002093892888888000, 146150163513497835403354048004187785777776000, 2923003270269956708067080960083755555552000, 58460065405399134161341619201675111111104000, 1169201308107982683226824384033502222222000, 2338402616215965366453648768067004444444000, 467680523243193073290729753613400888888000, 9353610464863861465814595072268177777776000, 187072209297277233176291914445375555552000, 37414441859455446635258388888890711111104000, 748288837189108932705167777777813333332000, 149657737637821785411033555555562666664000, 29931547527564357082206711111112533332000, 59863095055128714164413422222225066664000, 119726190110257483288826844444440133332000, 239452380220514966577653688888880266664000, 47890476044102993315530737777777533332000, 9578095208820598663106145555555666664000, 19156190417641197326212231111111133332000, 3831238083528239465242442222222266664000, 76624761670564789304848844444444533332000, 153249523341129578769777788888889066664000, 306499046682259157539555577777777133332000, 612998093364518315079111155555555666664000, 1225996186729036630158222311111111133332000, 245199237345807326031644442222222266664000, 490398474691614652063288844444444533332000, 980796949383229304126657777777777133332000, 19615938987664586082531555555555666664000, 392318779753291721650631111111111133332000, 78463755950658344330126222222222666664000, 156927519101316688660252444444444533332000, 313855038202633377320504888888889066664000, 6277100764052667546410097777777777133332000, 1255420152810533509282119555555555666664000, 2510840305621067018564231111111111133332000, 5021680611242134037128444422222222666664000, 1004336122248426807425688844444444533332000, 2008672244976853614851377777777777133332000, 401734448995370722970275555555555666664000, 8034688979907414459405511111111111133332000, 160693778148348289188110222222222666664000, 321387556296696578376220444444444533332000, 642775112593393156752440888888889066664000, 12855502251867863135484817777777777133332000, 2571100450373572627088963555555555666664000, 5142200900747145254177811111111111133332000, 102844018014945105083554222222222666664000, 205688036029890210167110444444444533332000, 411376072059780420334220888888889066664000, 8227521441195608406684417777777777133332000, 1645504282391121321376883555555555666664000, 32910085647822426427537671111111111133332000, 658201712956448528550753444444444533332000, 131640342591289705710150688888889066664000, 26328068518257941142030137777777777133332000, 5265613703651588228406027555555555666664000, 105312274073031765680120551111111111133332000, 2106245414460635313602411022222222666664000, 4212490828921271227204822044444444533332000, 8424981657842542454409644088888889066664000, 16849963115685084908819288777777777133332000, 3369992623137016881763757555555555666664000, 67399852462740337635275151111111111133332000, 1347997049254807526705503022222222666664000, 2695994098509615053411006044444444533332000, 5391988197019230106822012088888889066664000, 107839763940384602136440241777777777133332000, 2156795278807692042728804355555555666664000, 431359055761538408545760871111111111133332000, 8627181115230768171115217422222222666664000, 172543622304615363422304344444444533332000, 345087244609230726844608688888889066664000, 6901744892184614536892173777777777133332000, 138034897837292290737843555555555666664000, 27606979567458458155688711111111111133332000, 552139591349169163111375422222222666664000, 1104279182698338326222750844444444533332000, 2208558365396676652445501688888889066664000, 4417116730793353304891137777777777133332000, 883423346158670660978227555555555666664000, 17668467231734013219564551111111111133332000, 353369344634680264391291022222222666664000, 706738689269360528782582044444444533332000, 1413477378538721057565164088888889066664000, 28269547570774421151312817777777777133332000, 565390951415488423022655422222222666664000, 1130781902830976846453111044444444533332000, 226156380566195369290622088888889066664000, 4523127611323907385812441777777777133332000, 904625522264781477162488355555555666664000, 18092510445295629543249767111111111133332000, 361850208905912590864995422222222666664000, 723700417811825181729990844444444533332000, 14474008356236503634599817777777777133332000, 289480167124730072691996355555555666664000, 57896033424946014538399271111111111133332000, 1157920668498920290767985422222222666664000, 2315841336997840581535970844444444533332000, 463168267399568116311194088888889066664000, 92633653479913623262238817777777777133332000, 185267306959827246524477635555555666664000, 370534613919654493048955422222222666664000, 741069227839308986097910844444444533332000, 14821384556786179319558173777777777133332000, 2964276911357235863911675555555666664000, 5928553822714471727823351111111111133332000, 11857107

In addition

How good is **GEOS**? Andrew Fisher, Technical Editor of **GeoClub**, helps you make up your mind by introducing you to **GeoCalc**.

One of the benefits of seeing **GEOS** is the ease with which you can learn how to use a new application. Because all **GEOS** programs are based around the same windows and menu techniques, you can get **GeoCalc**, the graphics-based spreadsheet, up and running in just a few minutes when you know the basics. And there are many powerful options to help you get even more out of it.

What is a spreadsheet?

Essentially, this screen is divided into columns and rows. This grid is your database, although the terminology is a bit odd. Info about cells can be placed in numbers, text or as labels (text), or January for example, and even formulas.

Imagine you wanted to keep track of your accounts. Along the top row of the spreadsheet you type the months of the year. Down the left-most column you enter all the categories that your expenses and income can be divided into—grocery, utility, buying new software, printer, toilet paper, and so on. Into the cell where the "January" and "toilet paper" row and column cross, you enter how much you spent on the thing while still that month. And you repeat this for all the months and categories.

So, you now have a tidy stack of information. But **GeoCalc** can do more. You can enter a formula that says "add up the toilet paper" expenses from January to December and **GeoCalc** it in the cell, and you get \$54,564.31, automatically, and even recalculates it when you change the information. However, as well as doing simple sums, **GeoCalc** can easily do financial, trigonometric and statistical

functions (like calculating a percentage, the average or even the average (lowest + highest) on a single cell in a whole block of cells of one).

You don't even have to enter your accounts in a spreadsheet. Spreadsheets can keep their own statistics or league tables in a spreadsheet, as if you cut a Fantasy Football job you can enter each week's results and see how your team is doing.

You can design spreadsheets and spreadsheets with ease. There are hundreds of other uses as well.

Appearances count

You can also alter the appearance of your spreadsheet in many ways. You can change the

row	col	col	col	col	col	col	col	col
1	1	2	3	4	5	6	7	8
1	1	2	3	4	5	6	7	8
2	1	2	3	4	5	6	7	8
3	1	2	3	4	5	6	7	8
4	1	2	3	4	5	6	7	8
5	1	2	3	4	5	6	7	8
6	1	2	3	4	5	6	7	8
7	1	2	3	4	5	6	7	8
8	1	2	3	4	5	6	7	8
9	1	2	3	4	5	6	7	8
10	1	2	3	4	5	6	7	8
11	1	2	3	4	5	6	7	8
12	1	2	3	4	5	6	7	8
13	1	2	3	4	5	6	7	8
14	1	2	3	4	5	6	7	8
15	1	2	3	4	5	6	7	8
16	1	2	3	4	5	6	7	8
17	1	2	3	4	5	6	7	8
18	1	2	3	4	5	6	7	8
19	1	2	3	4	5	6	7	8
20	1	2	3	4	5	6	7	8
21	1	2	3	4	5	6	7	8
22	1	2	3	4	5	6	7	8
23	1	2	3	4	5	6	7	8
24	1	2	3	4	5	6	7	8
25	1	2	3	4	5	6	7	8
26	1	2	3	4	5	6	7	8
27	1	2	3	4	5	6	7	8
28	1	2	3	4	5	6	7	8
29	1	2	3	4	5	6	7	8
30	1	2	3	4	5	6	7	8

Henry Walker, you can insert and the results of the **GEOS** Formula 1 Championship in the spreadsheet (October 1994).

width of the columns, and how the numbers are displayed— from whole numbers, to-bolts and cents. It is an American program, after all. It can be up to the size of several A4 sheets of paper with a work of 113 columns and 256 rows, and you can choose whether to print graphically with or without the grid lines of the headings, or use your printer's built-in dot-or-MCU mode. You can also how the information in each cell is lined up (centered, aligned to the left or right edge) and whether it is in bold, italic, or even

GEOCALC



GEOS spreadsheets are available in a variety of languages, including English, French, German, Italian, Japanese, Spanish, and Swedish. The software is available on a variety of platforms, including Amiga, Atari, Commodore, and IBM PC.

GeoCalc

A spreadsheet that is manual and a bit... It all adds up (see 17) to **GeoCalc**, the **GEOS** spreadsheet for mathematical types.

side-table, this cannot change the font in **GeoCalc** however.

Transferring information

One of the great benefits of using **GEOS** is that you can transfer information between programs quickly. Information in a **GeoCalc** spreadsheet can easily be transferred to a different spreadsheet, or exported as a text format. The text format file can be used in **Database** and sent then to **GeoPublish**, **Database**, **Geo**, the graph and chart program **GeoChart**, or the database **GeoFile**.

Present of the database and chart program, along with other **GEOS** software will be heading your way soon. And, of course, you can transfer information into **GeoCalc** from the other **GEOS** programs.

To conclude...

To put **GeoCalc** into some sort of perspective, a 10 spreadsheet running under Windows would cost at least \$300, would need several megabytes of memory and hard-disk space and would be replaced by a superior product in six months' time. **GeoCalc** is the definitive Commodore spreadsheet, and it all fits neatly into 64K of memory. It's a bargain!

It all adds up!

GeoCalc won't work without **GEOS** (recommended version 3.0 because it provides extra features). **GeoCalc** is available in two versions:

- the 64, which has all the features mentioned in the review, above, and comes with a demonstration file and manual for CBI (cross-platform package is extra); and
- the 128 which also costs £29 but which works in 80-column mode, runs faster, and allows you to use the numeric keypad of the 128 to enter data more quickly.

Make contact

GEOS products are sold by **ES&S**. To get the current catalogue send your name and address and two first-class stamps to: Electric Boys Entertainment Software, 91 19 Singleton Road, Purley, Surrey CR8 2BP (call 0181 664 7500).

Or, to get in touch with the UK's only dedicated club for **GEOS** users, send an SAE to:

GeoClub, c/o Frank Cassidy, 63 High Barns Road, Droylsfield, Manchester M13 9PS.

Grin and repair it!

Part 2

 Illustrations by
Mike Roberts

Cures for connections and for BASIC bugs - Jason Finch concludes his course of preventative medicine.

So you can make the mistake of thinking your COM warrants a dose of pop and toss the keyboard to the side in the stuff? Or maybe your cartridges have stopped working? Perhaps you're a budding programmer who can't work out why the computer keeps chugging up a certain error message. In the second part of this definitive guide to caring for your kit, I look at these problems, and more.

Making the connection

Unless things are destined this way, you're going to get dirty, and the metal connectors on your cartridge port are no exception. Over time, all sorts of dirt and grime can build-up on the thin bits of metal that help your computer realise you're plugged in a cartridge. Look at any of the cartridges you own. Look at the end that



It's not that the cartridge is having a sleep with the computer and pretending it's not there; it's because you're let a heavier job build up

normally gets shoved into the slot at the back of the COM. You should see a couple of rows of metal connectors. Are they gleaming examples of shiny metallic surfaces? Unless the thing is brand new, the chances are that the answer is no.

When cartridges stop working, it's often the dirt on these bits of metal that is to blame. The only way that the computer can talk to the cartridge is by using these metal bits.

It isn't necessary for the two rollers on a cartridge to get stuck. It's not that the

cartridge is having a sleep with the computer and pretending it's not there. It's because you've let a heavier job build up

Don't worry.

I'm not talking about a problem the size of the Berlin Wall, all you need is very fine grade sandpaper from your local DIY store. Rub the surface of the metal connectors very lightly to remove excess grime. They should soon become shiny again. Of course, if they weren't, you're related to the hare! You have been warned.

Solder on

Those of you with more money probably have more things connected to your computer. The more things you have connected, the more things there are to go wrong, and the more wires and cables there are plugged in to the computer. Generally, nothing unwanted should occur as a result, but occasionally you can find that the wiring is damaged.



Have a wiring diagram handy and make sure you know what you're doing. Connecting two strands of the cable the wrong way around could be disastrous

If the wire itself is the problem, rather than the connection, it's best to plug a new one. Obviously, carefully dismantle the plug and check the connections. You may find that one of them has come off or is a bit dodgy. If this is the case you need to grab your soldering iron and give the little beast a boost. Note that you should exercise caution when



Using the

the wire you are soldering can get pretty hot, so be careful.

If more than one of the connections is faulty, make sure that you have a wiring diagram handy and that you know what you're doing. Connecting two strands of the cable the wrong way around could have disastrous consequences. If you are at all unsure it's best to take it to a computer repair shop or qualified electrician.

Exterminating bugs

The COM is a lovable machine in that it usually tells you where it's having a problem with your BASIC programs. There are far too many error messages to explain them all here, but the following are the six most common.

● **Bad subscript** This is to do with arrays. Your program is trying to reference an element of an array whose number is outside of the range specified in the DIM statement. If you don't specify a range using a DIM statement, the default is 0-10. This means that something like `PI(12)="Milk"` or `PI(12)="Omelette"` works unless you've modified the default, but `PI(12)="Milk"` or `PI(12)="Omelette"` causes problems.

The number in brackets is the subscript, and the error means you've broken a hard number to use. The chances are that these errors occur when you reference elements indirectly, using variables, such as `PI(PI)="Milk"` then `PI(PI)="Yog"` and you end up with PI being out of the allowable range. If you are using more than the 0-10





defeat elements, make sure you use a DOS statement at the start of your program. You also get the error if you try to use less or more dimensional arrays without setting them up with DIM. In other words, a simple PRINT FN(1) gives you an error, even though both numbers are within the allowable range.



■ **Extra ignored** This error normally occurs when someone else is using your program. You must have it typed in response to an INPUT statement and only the first few items are accepted. For example, if you have a command in your program that says INPUTTEMPER YOUR ADDRESS;X; and you have typed in "106, Tullahoma Road" the computer only accepts "106" as the answer. This is because a comma is used as a separator and therefore anything after it is ignored. Because you have only requested one item of information in the INPUT command.

■ **Illegal quantity** Certain functions or statements only expect numbers within a certain range. For example, you can only store values between 0 and 255 (inclusive) with memory locations using the POKE command. Similarly, there are only 65536 locations in memory. Therefore, something like POKE 1024768 gives an illegal quantity error. This quantity you've just specified is out of the allowable range — it's illegal. If you are using variables, make sure that they are set to the values you expect.

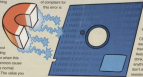
If you have a command along the lines of POKE 1024768 that gives the error, you can correct it when it bombs out by doing PRINT X to find out the offending value and then tracking back to discover when the wrong number was entered. Another common cause for the error is the MOD command. The normal format is MOD(A%(Y)) or MOD(A%(X)). The value you give it must be greater than zero.

■ **Real too far** This is caused by either incorrectly nesting loops or having a variable name in a FOR statement that doesn't correspond with one in a FOR statement. For example, FOR X=1 TO 5:FOR Y=1 TO 10:PRINT X:NEXT Y generates the error because you are trying to do the next X loop without completing all 10 loops. Also, if you exit your nested-loops, you may have changed the loop control variable (here the X) without changing the equivalent variable in the NEXT statement. You may have jumped to the line with the NEXT in the computer doesn't realize that it is currently executing a FOR loop. Check your bracketing if this happens.



■ **Out of memory** In most cases, the error message that refers to the same way as the out-of-DOS-command refers to data, this means that the computer cannot find any more memory. This could be for program space or for variables. If you try DIM A\$(20000) you get this response because there is not enough RAM available to set up the array. If memory isn't the problem, it could be you have too many nested FOR loops, or too many GOSUBs in effect. If you set up a line that says 10:GOSUB 10 and run it, you see what I mean. Each time a GOSUB command is given, the computer has to remember where to go back to when this is a RETURN statement. If you get lots of GOSUBs when GOSUBs from the computer run out of available storage memory for the return locations.

■ **String too long** Any string variable can contain up to 255 characters. If you try to assign more, then the CPU checks the error at you. A common cause of this error is:



accessing the tape from BASIC using the OPEN command. If you write, say, three 100-character string variables to tape with a PRINT#LABELS command, you can see problems when you read it back, an INPUT# J(0.0);(0) won't read in 300 characters, either. The strings are stored as one long run of characters and the INPUT# command doesn't know where one begins and the other ends. In effect you are trying to read in a 300 character string as 30 and the computer stops with an error. Instead, always use PRINT#A\$(0-49);(0-49) CHING 0\$(0-49) (0) which puts special codes between each string. These are the equivalent of using the RETURN key and telling the computer "Okay, this is the end of the string." Don't assume that because you get a STRING TOO LONG error in your read routine that the problem lies there — it's more commonly the write routine that's at fault.

Also, with tape, never send empty strings. If you have A\$(*)\$(0="COMMODORE" and C\$(FORMAX"), the variables are read back as A\$(="COMMODORE" and B\$(FORMAX"). Blank strings are treated, as are strings that just consist of

a load of spaces. Instead, make a blank string into CHR\$(0) which is a "blank" space.

Sticky moments

If doesn't seem to be progressing, it could be coffee or water or some other liquid. It is safe on to the computer, you should switch off and unplug the equipment straightaway. Someone should have told you to wear that electricity and all things wet just don't mix. (This is the reason why the light switch in your bathroom is on the ceiling, way out of reach, and you have to pull on a bit of string to work it — you always wondered why the string was there, didn't you?)

The way to solve the problem of spilling something on the keyboard is a controversial subject. While all experts agree on though it is that you shouldn't switch the computer back on for some time. The reason is that you could create short circuits and start to blow things up if you start pumping electricity around the



Remove the disk's coating and you could set a small forest in there, but not the entire forest!

diskly when it is wet. So, do what you just learn it to do for a few days and print "Go ahead, you try something, I'll have a look!" I should point out here that whatever you do yourself invalidates any warranty that you may have on your computer and that no one can then be responsible for the consequences of your actions apart from you. Not even me.

You could remove the coating of your disk and open everything up. Assume the damage. If you could set a small forest in there, but not the entire forest. If there are any to get sticky (because you've split a fatty disk), then try to wipe up with a damp cloth anything that looks dubious. However, by this I don't mean simply using any wetly coloured tissues or bits of clothing.

The next step in the cleaning job, then, again this is completely at your own risk, is to soak your computer in water for a quarter of an hour or so.



You can soak your computer in water for a quarter of an hour or so, then hang it on the washing line to dry for a week.

then hang it on the washing line to dry for a week. Next put everything together and the chances are it will all work. However, this should be a last resort thing only. Basically, if you have decided that it's either time to throw in the towel or try something desperate, try the one out for last. If there's another option, take it.

The most important thing to do is to switch off your CPU immediately, access the damage and, if it's not too bad, leave it on the table for a while. This is switching it back on. This is always a great move.



PD FORMAT

Andy Roberts reviews the latest demos, chats to a PD personality with a preposterous nose, and makes some pathetic jokes in the process.

COURTESY OF SOVIET

WRATH BEGONS!

You'd be forgiven for thinking that this re-production from the Wrath Designers group was created in the Soviet Union (or what's left of it). However, it's just a name - the group are actually based in Sweden, and



Why? C.O.S. it's very good!

as you've probably already guessed from the European origins, it's a border of a demo. This is surprising since the demo was created almost a year ago but, due to unforeseen problems, has only just arrived on the scene.

Surely effects and techniques used last year could take a little party by today's standards? C.O.S. is another well-running spectacle, meaning that you only have to load the first part - the rest of the demo runs automatically before your eyes colouring you to sit back and absorb the effects. This is fast becoming the standard for most magazines, but it does have its drawbacks in that you must sit through all of the song cuts, too. Oh, it would, except that Courtesy of Soviet doesn't have any lasting hits. Honestly.

The demo kicks off with film style credits, followed by a superb PU picture displaying some hair splatter type in a crash helmet. After another brief graphical interlude, in the form of a fancy intro/DO, come a couple of fractal-generated



The Red head blooms in the USA.

Sorry, that...

...is CDS and CDL, we stated that the demo group Cantarel were responsible for the highly acclaimed Ice Cream Castle demo. It has been brought to our attention that this demo was not created by Cantarel but by CDS&T. We would like to apologise to the first group for any inconvenience, embarrassment, or lack of sleep this error may have caused. The person responsible for this mistake has been asked, but has never returned to the ground, and we have obtained his grave collection of garden gnomes in charity.

landscapes (which, surprisingly enough, are pre-coloured rather than real-time). To heighten the senses even further another beautifully drawn picture fills the screen before the next part/DOs you meet completely. As a woman gases into her queue job, light sources split around and

PD PEOPLE

To regular 'Contributors' readers, the name War is synonymous with chess. Indeed, Warren 'War' Pilkington has been building games for chesslike years. However, he's also been a rather busy little fellow,

creating a multitude of demos and tunes for the PD scene. To mark the start of a regular series of interviews, Andy Roberts chats with Manchester's 32Bit most popular expert, and discovers a few lesser truths...
NAME: Warren
WILSON: Pilkington/War
AGE: 22
OCCUPATION: Beta Processing (back by day, CDL musician by night, hacker and editor at all other times)

FAVOURITE CD: BAMB, Hatched - great graphics, CDL but no better than Quincy music, and infinitely playable.
WORST CD: GAMB, Ninja Kicker (Freddie). This



Warren 'War' Pilkington. Beta Processing (back by day, CDL musician by night, hacker and editor at all other times)

has some of the best animation ever seen on any computer level... that.

FAVOURITE ARCADE GAME: Daytona USA, Street Out - local arcade has just installed a fabulous four-player version - cool.
FAVOURITE CD: MUSKOGAN, Red, Hatched, mainly because of the quality and quality, and for setting new standards for CDL music in the first place. I especially like his music from Skate or Die, Skatone (my all time favourite), Jokes, (best Kibitzed) - best!

FAVOURITE COLOUR: Sky blue, probably because it's Manchester City's colours (no prize for guessing the least favourite then - RED).
LAST GAME BOUGHT: None of the Golden Testament by Mastertronic, then a car boot sale for 50p. Don't miss out on this classic game!
THE WORST THING ABOUT DANNY BAKER: He's a bit of a fan (that's all).

CONQUERS: Downward, unexplained, and over fans. Would you play against a 100 for a game with over 2000? Most of the games seem to be passmore platform games, even the conversions. Yeh.

IDEAL JOB: TV Presenter, staff writer for the NME, or maybe an alternative conductor, after all, I've got a pretty weird sense of humour.
BIRTH: St. Mary's, Ipswich. Really weird - my CD collection of 200+ singles, 200+ albums, and around 100+ vinyl items (some from cassette, but not all) are evidence, from industrial to trash. By all-time favourite band would have to be the

Fixes, with PMS a close second. As for writing music on the CDL I like to lay down my own original style for times when possible.
FAVOURITE PIZZA Topping: Ham and mushrooms, commonly known as 'Parehouse' in Pizzia (not aficionados).

THE CDL: Because I enjoy using the machine! I've had my CDL for more than eight years and have had loads of software fun playing games, watching demos, as well as creating demos. There's a definite handbook of CDL users who know quality when they see it. I still think it's the perfect introduction to computing for a lot of people who can't afford an Amiga or PC (the only other format I'd ever work on). Notice how even your's is suddenly raving about the Internet? Well, as CDL users we had conquered many, many years ago. It's continued writing 60 music and demos for as long as people want us to.

BINARY CODE: Some two ago down 'Bony' Markovits of Binary Zone received a disk containing some of my demos, he read them, and suggested I produce a disc of demo's to review on the PD circuit. This idea is still available from them (I'm making disc 1 - see DISCOGRAPHY), so is the second compilation (I'm music disc 2). Later



Warren's nose is available here...



can perfectly coloured reflections, in amazing contrast which is beautifully executed.

After a brief political interlude, proclaiming 'Open Justice and Rights', presumably for Soviet citizens, another stunning piece of fantasy artwork progresses on to the screen. (It's the untitled, 'postmodern' or 'Special Postmodern' is an effort used mostly on TV news programmes to mask out the faces of criminals with a grid of squares).

Next come some colorful spinning sets (presumably to occupy your mind as the next section loads in), followed by another political message: 'We are all one people', an overused later line, probably. Finally, you are treated to another exquisite fantasy picture before its time to flip the disc.

Site. It's more of a silhouette than the first half, and begins with a series of hand-drawn flowers which, believe it or not, are the first hand-drawn flowers ever seen on the CD-ROM (and I thought they were late-1960s - 80s). After this is another thoughtful section featuring a huge eye which opens suddenly around the screen. Then the demo kicks into abstract mode, as a series of intricate, clean

patterns (some of which least enhanced effects) swirl and slide across the screen. Another foray into the world of politics, even more fantasy artwork, and then the demo closes with a rather apocalyptic plasma-effect.

Courtesy of Soveris's an era-ignoring demo, not only does it demonstrate first-rate programming, it also boasts some of the best artwork I have ever seen on the CD-ROM. Not, alas! Most of the pictures have been directly based on the artwork of Bruce Ware, and it would be stressed that there isn't a couple of cheap artists (as is usual in fantasy artwork). However, this by no means diminishes the demo.

The music, graphics, and graphics-rich soundtrack have been combined to make one kind of a demo, and, if you can't see the point, you may it be pointed to get hold of a copy of *Courtesy of Soveris*. Now.

SAVING 95%



PD Format Directory

Unless a particular piece of software is exclusive to a library, we never recommend a company to buy your PD software from. That's because PD software is free and most libraries should have all the latest software to stock. To make the choice easier for you we go for unpopulated lengths each month to compile this, the PD Format Directory, making it surely the most up-to-date public domain guide.

If you have never ordered PD software before write to a few libraries enclosing an SAE and asking for a recent catalogue.

Some libraries only stock disc-based software, so state whether you need a floppy drive. To make it easier for you, we specify whether the companies stock tapes (T) or discs (D). Look for the symbol after the company name.

If you run a PD library and can't find your company listed here, if you have discovered some software you think we should have listed or vice if you are a PD programmer with a new demo to share with the world, write to us at PD Forum, Commodore Format, PO Box 100000, Denver, Colo, Amer (SAE) 2000 or e-mail us at pd@pdformat.co.uk

getting 'PD Directory' in the subject line.

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ELASTIC BOYS PD (D)

1119 Brighton Road, Purley, Surrey CR8 9EF
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11 Glasgow Place, Edinburgh G2 3ER

BEAT BEBOP PD (D)

6 Ebor Gardens, Coupar, County Down,
Northern Ireland BT23 8DB

BEAT BEBOP SOFTWARE (D/D)

21 Tired House Lane, Pinner, Middlesex, Britain UB8, near Woodlands (011-43) = 0184 7777.

Fax = 0184 80026

e-mail:

Beigolova, Software@C1.fairfax.demon.co.uk
PLPD@D

80 Windsor Avenue, Whitehead, County Antrim,
Northern Ireland BT23 9SD

SHARPEARS PD (D)

PO Box 381, Wex, W83 07W

BTSPM PD (D)

16 Curlewton Road, Goshams, Aylesbury,
Buck (044) 692



suggested during some nice dinner with me for the Binary Zone Members Disk 2 as well as including some of my own demos which would be available to all sites.

Everything turned out rather nicely, so much so that I offered to do the status for the Members Disk 2 (and was pleased with the general quality of my recent productions, and so in October 1994 I told you about a proposed completion of an

entire games disc available as the *Share! For Up Construction Set* from *Peppermint Software*, and *CPD* and asked if I'd be interested in doing the music for them. I jumped at the chance, and after a while I think *Share!* had the finished product, *SHARE! MUSIC*, if any games writer requires soundtracks for any games they are writing, I'd gladly do it. (Contact me via Binary Zone or members@cpd.net)

SHARE! MUSIC: It's not dead but it's going through a strange phase, though.

SHARE! MUSIC: After I've finished the 'Keyboarder', I may make a disc on

Quadruped Telemetry 2 as I've another demo with new and original music (which I can't remember the title of at the moment).

FANTASY BEATS: Kratos Havel, had singer of *Thriving Music*, or maybe more *Rock Stars*, the infamous *Chameleon* had.

SHARE! MUSIC/CPD/SHARE!: I find it a suitable challenge to write back listings for the CD, and the machine code I learned to write the listings helped me, in turn, to write demos. Doing the book

Programming the Commodore 64 by Peter West helps enormously. I also use the *Search USA* *Beats Assistant* and *Share! Music* to write tunes. **FLAMES**: I thought they looked very silly, especially at the height of all that 'Washington' legs.

MUSIC/Demo CONCEPT: I've always thought it would be nice to have a collection of original music that would, if recorded professionally, make a suitable album (and I must confess I'd love to do one for commercial release). After writing the album

Sample, I decided I could do it. That's how the whole *Quadruped Telemetry* series came about. **ALBUM PERIODS OF ALBUM DEMOS**: Funny you should mention that... By the time you read this, a limited edition audio cassette of

Quadruped Telemetry, *Quadruped Telemetry 2*, *Subterranean Excursion*, and a compilation. One of those things (the best of *Zax Productions*) should be available. This will include new demos, and maybe even a new one. No. The compilation will be limited to 50 copies and will also come with a mini-cassette, and would make an ideal gift for non CD-playing friends.

PETALS OF THE CD: Funny, I'd say the PD scene will carry on for some time because, as I mentioned earlier, there is plenty of enthusiasts out there for people to write new projects. Ordering of games by mail order will become standard - always always find it commercially viable to do titles with overpriced console games instead of quality CD games. But let's be realistic that people out there will want to write games - respect to all formats.

MOORE! **SHARE! MUSIC**: I really loved *biology*. I loved the complexity. No wonder I got a GCSE grade C in it.

SCROLL TEXTS: Usually they are boring and I have to say that, on reflection, who are not suitable, but including funny stories can sometimes help to live up an alternative text full of text.

DISCOUNTS:

- *Zax Share!* disc 1 - £20.00
- *Zax Share!* disc 2 - £20.00

- *Binary Zone Members disc 2* - £33.00
- *Binary Zone Members disc 3* - £33.00

- Contact Binary Zone for more details about these, see the PD Format Directory, right)
- *Quadruped Telemetry 2* - £79.00, and the
- *Quadruped Telemetry*

- *Share! For Up Construction Set*

NEXT MONTH

Comet's Flower Power demo ranks as one of the greatest demos ever seen on the CD, but at last a worthy contender has arrived... We reveal the best demo of 1994... But can it really beat *Flower Power* or the all-time number one *Quadruped*?

TECHIE TIPS

King Arthur lies asleep under Camelot, waiting to return when Britain faces its greatest peril. Simply substitute Jason Finch for Arthur, and C64 owners for Britain and you see how legends are born.

drives drive, so far as C64 drives are concerned, and is reasonably quiet and very reliable. You can try a brand-new one from

Electric Blue

Entertainment Software for around eighty pounds, so make sure you don't get ripped off by the person selling the drive second-hand. It may be worth saving a bit longer and getting a new one, unless of course you can pick up a real bargain. IBM's have a policy of importing these drives from the States. If you have enough disk you can ask them to make a one-off import for you, but generally they wait until there are about ten people waiting in order to reduce the shipping costs. If you wouldn't need any additional hardware. The drive comes with the necessary leads and power supply unit. All you need to do is plug the drive into the power and then use a serial lead to connect the drive to the computer.

Any normal floppy is loaded into the computer from tape and then saved to disk with the LOAD/SAVE/SAVE/SAVE commands. If it's not a Basic program then you can't do this. Instead you can get the game up and running and then use something like an Action Replay cartridge to take a snapshot of memory which can then be saved to disk. You should

note that the should only be done on your own games and that making copies of any copyright material in this way is illegal. **Jason**



THE KEY TO SUCCESS

Dear Techie Tips, About eight years ago I purchased a game called "World Class Laserball" for my C64 on disk. It was released by B.B.Gold. The game was supplied with a security key that I have recently lost. It was about one inch long with a resistor at the back which you plugged into the cassette port to enable you to play the game. I need to know if you could tell me what said resistor is used and what components would be made in the cassette port, or if there is a program I can use to bypass the security mechanism in the game. I have contacted B.B.Gold but the keys are no longer available. **J.L. Smith, Birmingham.**

I don't have access to a wiring diagram for the security key that was used on this and other software unfortunately. The tape version obviously had the Datawaste plugged into the tape port rather than a security key and the way that was controlled was that the game would crash unless you left the PLAY button pushed down. It is, I think, the case that if you plug a Datawaste into the port, and then press PLAY before loading the game from disk, it then runs perfectly. The game shuts the tape motor down so the tape won't go round. It could very well be the case that the security key simply simulated the effect of keeping the PLAY button down. **Jason**



WHAT A CHARACTER

Dear Techie Tips, I've got three questions... here they are:

1. Is it possible for me to do character to character
2. Is there any way in which you can detect what character a sprite has collided with?
3. I do not know how character bounces or interlocking works. Can you tell me? I really would be most grateful. **John Smith, Liverpool.**



THINK TWICE

Dear Techie Tips, I am considering buying a second-hand disk drive. But there are a few questions I would like to have cleared up first.

1. If I do get a drive, which would be the best value for money?
2. What other hardware would I need as well as the disk drive?
3. Is it actually possible to transfer games and files to disk?

Charles McBrine, Glasgow

1. The best one would be a 1041 IBM. This is quite a



RANDOM REPETITION

Dear Techie Tips, I sometimes use my computer, sets up and every second key on the outside of the keyboard refuses to work. Any idea what's wrong?

2. When generating random numbers is there any way to stop a number which has come up from coming up again so that the same numbers are not repeated? **A.N. Omer, Dublin.**

1. This could be due to the connections from the game pads. Check port one in particular. It is unlikely to be anything to do with the connector and cable from the keyboard to the sound board of the computer. The fact it is every second key on one of the rows does point to something being wrong in the interpretation of the eight-by-eight matrix that is used for scanning the keyboard. This could be caused by interference from the joystick port.
2. If you were generating random numbers between

1 and 255 and you wanted to ensure that none were repeated, you could set up an array like DIM A(255) that would have all the elements set to zero. Whenever a number was generated, say R, you would do A(R)=1 to mark it as already generated. Each time you generate a random number, check A(R) to see if it is zero or one. If it's one then pick another number. But a far easier method is to assign the numbers 1 through to 255 in order to A(255) followed by a routine that sweeps through the array swapping each entry with one at random. This creates a full array of the numbers 1 to 255 in random order with no repetitions. Sorry. The following short program will do it. I have used the array A(4) instead of A() because this is an integer array which saves memory. In Assembly we could use 00A-025 and so we can use an integer array.

```
10 DIM A(4)
20 FOR I=1 TO 200:R=INT(RND*255)+1
30 FOR J=I TO 200:PRINT PRINT(255)-I
40 T=A(I):A(I)=A(J):A(J)=T
50 NEXT J
60 FOR I=1 TO 200:PRINT A(I):NEXT I
Jason
```

1. Is what sense do you mean? You cannot print two characters on top of each other and therefore this seems a bit odd. If you had two square block characters moving across the screen with some X and Y coordinates, it would probably be possible so as if they had collided by interchanging the coordinates and changing one pair against the other. There is no simple way to do this. You must do a lot of math to work out the X and Y screen coordinates of the spots. This varies due with X-Y1 (PKEY)X2345-0000 and Y-Y1 (PKEY)X2345-0000 for spots zero. This should give you a value in the range 0-24 for X and 0-24 for Y. You can then do (X-Y24)*Y24-X to find the screen location and C-PKEY00 to home character that is on the screen at that location. However, later in our M80 line-of-spots and that in practice you are going to need some extra code to deal with the case where the physical horizontal coordinate of the spots is more than 255. As soon as the spots pass over the M80 line, the actual horizontal value needs itself to zero, and the M80 flag for that spot set 0 (location 0206) is changed to one.

2. Some features have been written on this subject, including a couple in recent issues of CF. Basically you split your backgrounds into stages. An object may be the top part of a column, a bush, a cloud, some clear blue sky, or some other similar thing. Each object is made to be the same size, say four by four characters. In the column needs to be filled from four characters, you just pack the 0000 cell with spaces. The background map then references objects rather than individual characters. So if you had four by four blocks, the 0000 would only be ten lines across by one block. So a screenshot of information can be stored in 60 bytes. This is the principle at least.

Jason



SHESIE SWAP

Bear Feline Tips, I could try SHESIE to get a Commodore 64 because SHESIE games cost me loads of money.

It first started when my mate made me play Mayhem in Wolverhampton. That's a top game and feels as good as any SHESIE game I've ever played. The next thing is I'm going to need you to answer some questions, please!

1. Could you give me a listing that makes eight spots (each 24 by 21) please/is there one big spots type thing?
2. Was it worth me selling my SHESIE for a Commodore 64?
3. How do you know how much data to read in with a SHESIE command?
4. How do I get a game published? Gallery Newsletter.

It depends if you want them all in a line, or in a block with three on the top, three in the middle and two on the bottom, and so on. To display all eight spots you would do PKEY 0200-255, individual spots can be positioned with PKEY

0206-472, a PKEY 0206-472, where 472 is the spot number (0-7), 4 is the horizontal position and 7 is the vertical position. You may also need to do PKEY 0204-PKEY0300-0000 for 0-9, PKEY 0204-PKEY0300-0000-0700 to enable the M80 on and off respectively. The M80 is a line that turns them the right hand side of the screen. When you do PKEY 0200-255 you will see that the spots is not so far right as it could possibly go. If you then do PKEY 0204-0700 0204, it will move right one pixel. This has gone over the M80 line. It's a curious concept, but one you will get the hang of quite easily. The ^ character is the up arrow on your keyboard. Also do PKEY 0200-04P to change the cursor values for spots. Our spot animation feature should give you some ideas.

2. Of course it was. A SHESIE is great if you want to regulate and just play games at once. With a C64 you can do that and more. There is the regulation stage when you finish it, but there is also the escape to get your hands dirty with a lot of programming. Plus the games on a Commodore 64 are far cheaper and much more playable.

There are plenty of classic C64 games. I can't think of many classic SHESIE games, only expensive ones that last about ten hours before you finish them.

3. You will generally use GAT1 as a program for a reason. Spines have 64 items of GAT1 each, for example. Therefore if you wanted to read of the information for ten spots you would know to read in 640 items. For anything else you can always add a ^7 GAT1 item at the end of the end of the list to adjust.



set your

routine to

stop reading

since it has found the

-1. You would do that quite easily with a routine like

this one:

00 0A0

20 PKEY X OF 3-1-7-0-0-0

30 PKEY 1004-4-2

40 0070 00

50 PKEY PKEY OF PKEY0000

100 027A 000 000 0 0 0 0 0 0 0 1

110 027A -1

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TECHIE TROUBLES CURL UP AND DIE!

Jason Finch is the Techie

Hitman. The god of his knowledge

has built up a library one by one of problems, leaving a gaping void around of cooperation.

If you're in trouble, if someone else can help, and if you can find him, maybe you can write to Jason. Here's how. Pop back to reviews. Write an anonymous Techie Tip, Commodore Format, Future Publishing, 98 Moorcroft St, Barks, Essex, SS4 2PR. Put on a cap and leave in your best. Easy.

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