Only 85p

DM 6.8

commodore HORIZONS

March 1985

Electronic education – making learning fun

* Programming the Vic
* 64 bulletin boards
* C16 listings

Digital Integration FIGHTER PILOT contest

Micromega's Hanan Samara profiled

Boost your Brainpower

WIN a Ferguson TV from DER

* Exclusive Las Vegas report *

Commodore C128

The Chart Topping Flight Simulation Now On CBM 64.

FIGHTER PILOT

ALSO AVAILABLE ON THE 48K SPECTRUM

FREE COLOUR POSTER AVAILABLE WITH DISK VERSION

BY D.K. MARSHALL
ADAPTED BY DARRELL D.

COMMODORE 64

COMMODORE 64.

Fighter Pilot Disk		☐ £14.95
Fighter Pilot Cassette		☐ £9.95

LOADING TIMES
DISK – 147 SECS
CASSETTE – 300 SECS

SPECTRUM

Night Gunner	48K	☐ £6.95
Fighter Pilot	48K	☐ £7.95
Tomahawk	48K	**Coming Soon**
TT Racer	48K	

VAT and p. & p. inclusive within UK
(Overseas inc. 55p. per cassette)

Cheques payable to Digital Integration Ltd
I enclose a cheque/P.O. for_____Total
Name_____
Address_____

Or debit my Access Account No.

Tele Sales
(0276) 684959

Please send to Digital Integration, Dept
Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

DIGITAL INTEGRATION

Watchmoor Trade Centre,
Watchmoor Road,
Camberley, Surrey
GU15 3AJ

Trade and Export enquiries welcome. Lifetime Guarantee.

commodore HORIZONS

Editor
Christopher Jenkins

Production Editor
Barbora Hajek

Editorial Secretary
Geraldine Smyth

Group Advertisement Manager
David Lake

Advertisement Manager
Jeremy Kite

Administration
Theresa Lacy

Managing Editor
Brendon Gore

Publishing Director
Duncan Scot

Telephone Number
(all departments)
01-437 4343

UK address
Commodore Horizons, 12-13 Little Newport Street, London WC2H 7PP.

US address
Commodore Horizons, c/o Business Press International, 205 East 42nd Street, New York, NY 10017.

Subscriptions
UK £10.00 for 12 issues, overseas surface (excluding US and Canada) £16.00 for 12 issues, US and Canada airlifted US$33.95 for 12 issues.

ABC

Submitting articles
Commodore Horizons welcomes readers' contributions — either articles or program listings. Articles should be typed double-spaced with a wide margin. Programs should, whenever possible, be printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return every article or program submitted, so please keep a copy. If you want to have your program returned you must include an s.a.e.

SUNSHINE

Commodore Horizons is published monthly by Sunshine Books, Scot Press Ltd. Typeset by In-Step Ltd, 33-41 Dallington Street, London EC1. Printed by Riverside Press Ltd, Thanet Way, Whitstable, Kent. Distributed by SM Distribution, 16-18 Trinity Gardens, London SW9 (telephone 01-274 8611, telex 261643). ISSN 0265-4164. Registered at the Post Office as a newspaper.

© Sunshine Books 1985.

CONTENTS

Letters 7
The ten pound star letter, questions and answers plus Fink

News 8
Commodore's PC, the end of the elephant, C16 software and words from Currah and Adman

Soft Hits 11
Automan, Indiana Jones, battles, canoes, helicopters, starships — it's all a game

Use Your Brain 17
Mike Grace looks at applications packages for the 64 from Brainpower

Las Vegas Report 20

News from the Consumer Electronics Show on Commodore's new micros and add-ons

Programming the Vic 25
An extract from Raeto West's definitive manual on the Vic-20

Education Special 28
Phil Bonner's round-up of teaching software comes to some learned conclusions

Tower of Adventure 32
Barbara Conway turns up the collar of her trenchcoat and seeks Valkyrie 17

C16-Plus/4 Companion 34
Concluding our extract from Brian Lloyd's introductory book

Bulletin Boards 36
Using your modem to tap into these fast-growing information sources

Profile 38

A talk with Hanan Samara, Micromega's first 64 programmer and a female too

Software File 43
Our first C16 listing, a flight simulator, plus a Vic 20 battle game

Classified 52
Your handy marketplace for bargain software and hardware

Answer Back 54
More technical questions tackled by brave Jack Cohen

Win a TV/monitor 56
DER offer a fabulous Ferguson MC01 in this easy-to-enter contest

Fighter Pilot Contest 58
Digital Integration's exciting combat simulator for the 64 is up for grabs

EDITORIAL

THEY SAY that trends started in America will hit the UK six months later. If that's so, the news from the Las Vegas Consumer Electronics Show suggests that the C16 and the Plus/4 have about that much longer to live.

This issue's show report makes it glaringly obvious that the two machines have earned no support from independent US software producers, and so their future must be in doubt. Sales of the C16 have been good in the UK, but it's the American market which must determine its eventual fate.

Commodore's mistake has been to introduce machines which offer no new technology and few extras for the user. Arch rival Atari, meanwhile, has announced a whole series of eight- and sixteen-bit machines at budget prices, with a variety of compatible peripherals and a unique user-friendly colour coding system.

It seems that for once Commodore has been upstaged, and must fight back if the company is to retain its dominance of the world market.

The main weapon will be the C128, which, as our review explains, neatly safeguards the future of the Commodore 64 by offering three modes of operation; a 64-compatible mode perhaps intended mainly for games, a 128K mode for serious users, and a CP/M operating system mode for fully professional use.

If the C16 and Plus/4 were intended as the next generation of Commodore computers, then the idea seems to have failed. If they were intended as stop-gaps which will soon be obsolete, then many buyers will be disappointed. The C128, though, seems to offer a more secure future to Commodore users. Let's hope that this time the independent software producers have more faith in the product.

Instead of ten aliens, C
for his Commodo

What happened ne

Saturday morning.

Waltzed into my local computer shop.

Packed as usual with masses of kids enjoying the arcade games.

Surely there must be a better use for my Commodore 64. Helpful assistant suggests a Communications Modem.

Tells me it comes with a year's free subscription to Compunet, a new network service, saving me a cool thirty quid.

A bargain not to be missed, so I bought a Modem.

If I knew then, what I know now, I'd have thanked that assistant more.

Saturday (one week later).

Fantastic.

My Compunet membership came through this morning.

Hurriedly plugged the Modem into my 64's cartridge port, and hooked up to the telephone line.

Can't wait.

At last I can communicate with other Commodore 64 Modem owners and giant mainframes.

What's more, I can also access databases throughout Europe and the U.S.A.*

This is what home computing's all about.

Sunday morning.

Raining.

Tapped in my Compunet I.D. and personal password.

Wow, what a directory!

Decide to pit my wits against other Modem users by entering Multi User Dungeon, an interactive on-line game.

Should stretch the old grey matter a bit.

Then a quick look in 'The Jungle.' This is an open area where other Modem owners display messages.

See a Commodore user in Fife wants to sell 'U-boat' for £3.00.

Leave message offering him 'Mighty Gork' on a straight swap.

Monday evening.

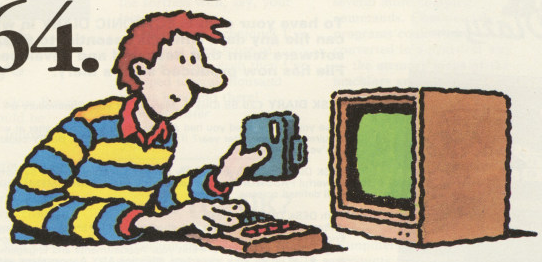
Move on to the Compunet Software Park.

What a choice. Loads of high quality bargain programs.

Particularly interested in educational software, so I call up 'The Study.'

Download free physics package to help with my exams.

, Clive bought a Modem dore 64.



next changed his life.

Tuesday evening.

Dad's turn.
I don't get a look in as he's busy teleshopping.

Actually it's amazing what bargains turn up. He even finds a new house.

Mum said she doesn't want to move and anyway his dinner's getting cold.

Wednesday evening.

Discover I can join BLAISE,* the computer service for the British Library.

Their catalogue of books dates way back to 1950.

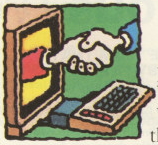
Should give me an interesting edge over my school chums.

Thursday evening.

Sis has a go.
She keys into Prestel.*
Imagine, over 300,000 pages of information and news.

What does she choose? The lonely hearts section.

She's disappointed. Couldn't find Simon le Bon's private number.



Friday evening.

Yippee! Receive a reply from the guy in Fife.

He fancies taking on Gork.

What's more he's written a program he'd like my opinion on.

He transfers it direct, using the free user to user software.

I've made my first computer pal.

It has really been a week.

Best one I've had since getting my Commodore 64.

Sure am glad I got the Modem instead of all those aliens.

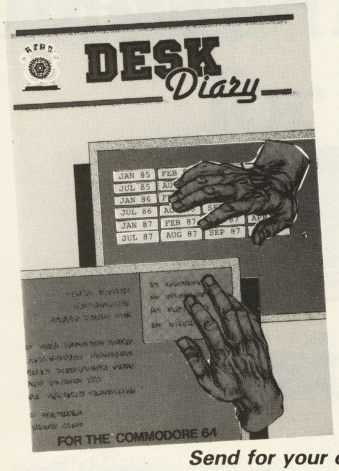
The Commodore 64 Communications Modem comes as a complete package with a year's free subscription to Compunet, for just £99.99 inc. VAT.

Find out how a Modem can change your life. See it now at Dixons, Curry's, Comet and selected Commodore dealers.

commodore

For further information phone or write to:
Commodore Communications Modem, 1 Hunters Road, Weldon, Corby, Northamptonshire NN17 1QX, Tel: 0536 205252.

*Require additional subscriber charges. Prestel is a registered trademark of British Telecom.



It makes sense...

To have your own ELECTRONIC DIARY in which you can file any data which is essential to you. The software team that designed and developed Easy File has now produced such a diary.

DESK DIARY £29.95 (Disk + Manual) for your Commodore 64.

Have you ever wished you had a diary which you could alter at will to suit your requirements year after year? If you have then DESK DIARY could be the Diary you've always wanted.

DESK DIARY is a powerful Diary Information Management System. It features Powerful PASSWORD protection for the entire DIARY, MENU driven routines and well defined screens.

With DESK DIARY you can:—
● Protect your DIARY from unauthorised entry ● Enter your Appointments and Engagements for any date up to 31.12.1992 ● Refer to your Appointments and Engagements at any time ● Edit your Appointments and Engagements at any time ● Call up for your immediate attention ANY Appointment and Engagement at any time ● Record important dates, text and anyother information at nay time, e.g. your tax details, your professional advisers, events and their dates which are important to you ● Refer to your recorded information at any time ● Edit and update your recorded information at any time ● Call up for your immediate attention ANY page of your recorded information at any time ● Leave a MESSAGE for another authorised DIARY user ● Study the dates of a calendar month in any calendar year from 1983 to 2057 ● Read ANY Data File which has been created by EASY SCRIPT, EASY FILE AND EASY CALC ● Prepare ANY of your DESK DIARY Data Files to be read by EASY SCRIPT ● Initialise your Disks, make copies of your Data Disks, Delete entire Data Files, Rename your Data Files

Send for your own Desk Diary NOW

It's ingenious...

AND IT'S FROM THE SOFTWARE TEAM THAT DESIGNED AND DEVELOPED EASY FILE

DIGITAL LAB £29.95 (Disk + Manual) for your Commodore 64

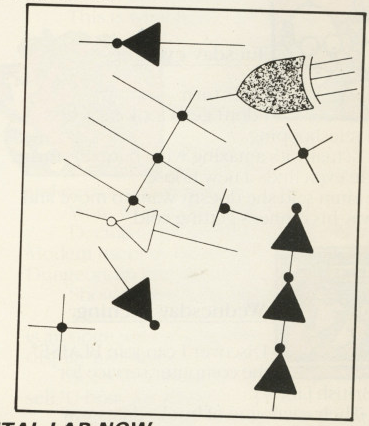
DESIGN your own LOGIC CIRCUITS using AND Gates, OR Gates, EXCLUSIVE OR Gates, INVERTER LINKS, Simple LINKS, ANGULAR LINKS, TAPPINGS and JUNCTIONS with this ingenious Software Program.

DIGITAL LAB is a powerful Program which performs various functions of a LOGIC LABORATORY. With DIGITAL LAB you can design and construct your own LOGIC CIRCUITS. You can select any LOGIC ELEMENT and LOGIC LINK from a comprehensive set of MENUs. DIGITAL LAB will check the validity of every LOGIC GATE and LOGIC LINK in your CIRCUIT. It will analyse your LOGIC CIRCUIT and the results of its analysis will be displayed in a TRUTH TABLE with the corresponding Boolean Expression.

DIGITAL LAB contains many other features and UTILITIES which are very useful to such an Application including a set of Disk House Keeping UTILITIES which allows you to FORMAT all your Disks, make copies of your Data Disks, DELETE entire Data Files and RENAME your Data Files.

DIGITAL LAB is a unique tool for pupils, students and anyone else who would like to extend their practical approach to Designing and Constructing LOGIC CIRCUITS. With the use of DIGITAL LAB understanding LOGIC CIRCUITS is made easy and you can enjoy the atmosphere of a LOGIC LABORATORY in the comfort of your own home.

DIGITAL LAB is easy to operate and will help to provide a clear understanding of Boolean Albegra with refrence to LOGIC CIRCUITS. It is written on Commodore 64, 6502 Assembly language and is therefore very fast in its operations.



Send for your own DIGITAL LAB NOW

To: **Associated Services (London) Ltd., 23 Chesham Street, London, SW1X 8NO.**
Telephone: 01-245 9522

Please send me the following software PRODUCTS (Disk + Manual):

DIGITAL LAB_____ copy/copies at £30.95 each (£29.95 + £1.00 p&p. £_____

DESK DIARY_____ copy/copies at £30.95 each (£29.95 + £1.00 p&p) £_____

TOTAL £_____

I enclose a cheque/Postal Order for £_____

Please charge £_____ to my credit card (specify card) Access/Mastercard/Visa

Card No

Expiry date_____ Signature _____

Name.....

Address.....

.....Post Code.....

LETTERS PAGE

Beach boys

I WONDER if fellow Beach-Head players would be interested in the following points.

Ignore the secret passage — go straight for the fleet. If the surveillance aircraft is hit dead centre, it will continue to add 2000 points to your score as long as you keep hitting it. For this reason, play at Level 1 to attain maximum ammunition.

By counting the number of fighters you hit you can judge when the next surveillance aircraft will be on screen.

It pays to lose some ships at this stage in order to notch up high scores by shooting down fighters.

Allow five ships to be sure of defeating the battleships. The distances of these ships varies from game to game, but the relative distances from each other remain the same — for instance if the aircraft carrier is at 52.5 degrees elevation, the other ships from left to right are at 68.5, 60.5, 74.5 and 24.5 degrees.

Having got eight tanks to the beachhead, every tank and bunker hit will score you points if hit early enough — it pays to get your first tank through to Kuhn-Lin as this offers more obstacles and hence potential points next time.

Having decided on the most profitable screen, crash your tanks at the final bridge until you can be sure of destroying the fortress with, say, your last two.

Using these techniques I've achieved a high score of 533,000 — but even then I've dropped several thousand points here and there!

Edward Lister
Sheffield
Yorks

16K Vic ≠C16, OK?

I OWN A Vic 20 and 16K expansion pack. I notice that the C16 has only 12K of RAM free to the user — does that mean that it might be possible to convert C16 software to run on the Vic + 16K, or vice versa?

G J Thomas
Ammanford
Dyfed

VIC 20 Basic programs will run on the C16, but it would be difficult to convert C16 programs to run on the Vic since the C16's Basic has several more complex commands. Commercial programs couldn't be converted in a practical way — the memory maps of the machines are totally different.

The CP/M business

I HAVE A 64 and intended to get a disk drive and CP/M cartridge to run COBOL. I am interested in pursuing a career which involves computers, particularly in the accounts field. Can you give me some advice on how to learn more about the subject, and on the status of the Commodore CP/M cartridge and using it with COBOL?

A Dewar
Aldfield
Oxon

THERE'S NO practical way to learn about business systems except to take a course such as an HNC through a technical college. Commodore's CP/M cartridge has been spotted in some specialist London retailers — it consists basically of a Z80 chip, though we don't yet know if Commodore's implementation of CP/M allows standard versions of COBOL to be run. The new C128 will include a CP/M facility which may be easier to work with, if you can wait for the machine to become available. Try phoning Commodore's technical information service on 0536-205252 for more help.

£10 winner

Copyright fight

I AM THINKING of developing an adventure program for sale. I think it best to sell it to a company rather than to market it myself. I have no experience of dealing with companies which market software, but it would appear very easy for any company receiving software to copy it for sale without paying me. Is there any way around this problem?

A E Alcock
Winton
Bournemouth

ANY ORIGINAL work is copyrighted by the very act of creating it — there is no need for it to be registered in any way. The best way to defend your copyright is to deposit a copy of the work with a solicitor, so that in case of any breach of your copyright you will have proof of ownership. Legal action is expensive but is very rarely needed — most software companies are too aware of the problems of copyright to knowingly violate your rights.

£10 prize letter

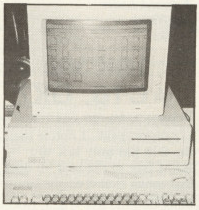
BECAUSE we know you're all busy people with plenty to do, we're offering you bribes to spend your valuable time writing to Commodore Horizons. Each month we'll give a £10 prize for the most interesting letter on hardware, software, computing, or life in general. The ball's in your court . . . get writing!

This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons, 12-13 Little Newport Street, London WC2H 7PP

NEWS DESK

PC—compatible on the way

COMMODORE's IBM PC-compatible machine was seen in working form for the first time in the UK at the Which Computer Show in Birmingham. Although the unit was seen in operation running **WordStar** and **Silicon Office**, there were no details available on the operating system, cost, or date of availability. Northamber PLC has been appointed as national distributor of all business systems.



Commodore affirmed its commitment to the business market — specifically the PC and the 8000 series machines — which leaves the Plus/4 looking as if it will be left in the cold again. See the Las Vegas CES report in this issue for more details of the new Commodore personal computers.

DK buys Currah

CURRAH COMPUTERS, distributor of the **Speech 64** voice synthesiser, has gone into receivership. After an initial announcement that the Speech 64 and other Currah products would be sold by the assemblers Welwyn Electronics, established peripherals and software manufacturers DK'Tronics stepped in to buy Currah. Roger Barnard, marketing manager of DK'Tronics commented "we have bought the rights to the Currah trading name, and the exclusive copyright to the Currah range."

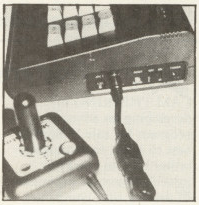
DK'Tronics plans to re-open its US branch to market the Speech 64. Meanwhile Adman Electronics, producer of the rival **Adman Speech Synthesiser**, has announced a new device compatible with Commodore's **Magic Voice** software. Although programs like BJ and the Bear are already available, the Magic Voice unit may never be distributed in large numbers. The Adman unit is compatible with all software designed for the old Adman speech synthesiser, which is to be discontinued, and with 95% of the vocabulary of Magic Voice. Adman's Mike Shorrock explained "The commands and syntax are the same as Magic Voice, but words stored using the extended VOC command on the Magic Voice may not work on the new **Speech Maker**. In those cases the Speech Maker will voice a pause."

"The Speech Maker copes with phonetic word construction and preset vocabulary, so it gives the best of both worlds. We've simplified the method of operation, and hope to make it available in February at £29.95."

We'll be carrying more details of the Speech Maker in our forthcoming speech synthesiser roundup. Meanwhile contact Adman at Ripon Way, Harrogate, N. Yorks, 0621-740972.

Business and pleasure from Impex

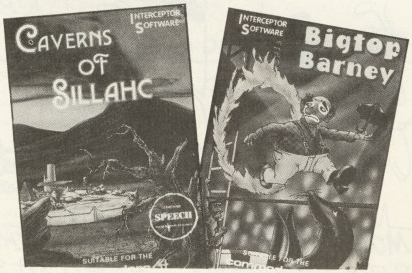
IMPEX SOFTWARE has announced two products designed for C16 — Plus/4 users. **Company Pac 1*2*3** is the first business program for the Plus/4 to receive official Commodore Approved status. It includes sales ledger, purchase ledger, invoicing, stock control, nominal ledger, profit and loss and balance sheet facilities integrated on one disk.



The program will cost £98.95, or only £50.00 for the first 50 purchasers. There's also a CBM 64 version planned, which will be compiled for greater operational speed.

For less serious applications the **XRI** joystick adaptor allows you to use standard D-plug joy-sticks with your Plus/4 and C16. Costing £2.25, the XRI has a standard Commodore joystick socket on one end and the new miniature 8-pin DIN plug on the other, so you don't have to throw away your favourite joystick. Contact Impex at Metro House, Second Way, Wembley, Middlesex, 01-900 0999.

Interceptor's latest stunts



GAMES SPECIALIST Interceptor Micro's has announced plans for the next batch of Commodore releases.

Bigtop Barney features a clown who must complete four death-defying acts to win the applause of the crowd. These include tightrope walking, pedalling a uncycle and trampolining. The game will cost £7.00. **Caverns of Sillahc** is a space adventure in which you must pilot a ship through alien caverns to recover your stolen agricultural droids. Hazards include mines, tanks and landslides. The game also costs £7.00. **Villain** runs on the 8 or 16K Vic and costs £6.00. It's an arcade extravaganza in which you must proceed in your life of crime while avoiding the unwelcome attentions of PC Plodd. Lastly **Break Fever** allows you to control an energetic dancer with your joystick. The 64 game features head spins, turtles, back slams and "The Shuttle", and as a bonus the B side of the tape features a specially mixed audio version of the game theme tune.

Contact Interceptor at Lindon House, The Green, Tadley, Hants, 07356-3711 for more details.

Tandata turns up trumps

COMMUNICATIONS specialist Tandata has announced a new software package which provides extra facilities such as saving incoming data to disk, printing incoming line data in scroll mode with 40 or 80 columns, using word processing facilities and sending data direct from disk in 300/300 mode.

Smart Modem is available on disk and costs £34 + VAT. The 64 version includes a full manual, and can be obtained from Tandata, Albert Road North, Malvern, Worcestershire, 06845-68421.

The company has also announced a price cut for its **TM200** multi-baud rate modem. The TM200, which offers 75/1200, 1200/75, 1200/1200 and 300/300 baud rates, will now be £173 excluding VAT, a drop from £217. Tandata's MD Roy Pendleton said "The price cut has been made possible by the increased volume of production and sales throughout our product range, which enables us to pass on the benefits to our customers."

"Pack your bags, pachyderm" — CBM jumbo lumbers off

COMMODORE's big Christmas advertising campaign ran into trouble with the RSPCA — after the event.

The campaign, which culminated in a television advertisement showing an elephant in boxing gloves, drew several complaints from members of the public. As a result the RSPCA objected, and the IBA, responsible for the content of all TV advertising, requested the advert to be discontinued. "By that time", commented Bob Johnson of Commodore's ad agency Grandfield Rork Collins, "the campaign had finished anyway. In any case, the script had been cleared with the Independent Television Contractors Association, and we had contacted the RSPCA before the ad was made. Their press officer told us that so long as the regulations on the treatment of animals were adhered to they had no objection to the ad. Unfortunately the press officer concerned left the RSPCA, so they thought that we had not cleared the ad with them when the complaints arose."

"It seems we were singled out by a vociferous minority — we wouldn't condone any ill-treatment of animals, and no mention was made of other campaigns featuring chimps, labradors and parrots."

"We're now planning next year's campaign, but since we don't yet know what angle it will be based on it's too early to say what form it will take."

New progs aimed at Plus/4, C16

COMMODORE has announced a range of cassette and disk programs for the C16 and Plus/4, covering the games, education and utilities markets.

Start Programming with Zortek and the Krytobytes is a sequel to the popular **Zortek and the Microchips**. It will be available on disk or cassette. **Hide and Seek**, **Number Builder** and **Number Chaser** are educational games intended to develop memory, shape recognition and arithmetic skills. **Jack Attack**, **Viduzzles**, **Pirate Adventure**, **Atomic Mission** and **Strange Odyssey** are cartridge based games, most of which are priced at £11.99. **Mayhem**, **Harbour Attack**, **Stellar Wars/Blitz**, **Crazy Golf** and **Fire Ant** are cassette games costing £5.99.

There are six Infocom disk-based adventure games planned for the Plus/4 only; **Zork /1/2/3**, **Starcross**, **Deadline** and **Suspend**.

Further in the future are **Introduction to Basic Parts 2 and 3**, **Games Designer**, and for the Plus/4 only **Magic Desk 2**, a cartridge-based icon-driven productivity program, and **Tony Hart's Art Master**, an adaptation of the CBM 64 program.

We'll be reviewing all these products as soon as they're available. Meanwhile contact Commodore at 1 Hunter's Road, Weldon North Industrial Estate, Corby, Northants.

CIL lets SX-64 get the information

CIL MICROSYSTEMS has introduced a Commodore SX-64 version of the ADS data acquisition unit designed for the PETs.

The ADS interface fits into the slot in the front of the SX-64, and has four analogue inputs, two analogue outputs, plus or minus ten volts span with 12 bit accuracy, four TTL inputs, and four relay closures for control applications. The interface is programmed in CBM Basic.

The entire system, with SX-64, ADS interface and software costs £1450. Alternatively the interface can be bought separately for £500.

For more details contact CIL Microsystems, Decoy Road, Worthing, Sussex, BN14 8ND, 0903-210474.

the six-four supplies co

p.o. box 19, whitstable, kent ct5 1tj

Access/Barclaycard orders: 0227 266289

...Number One For Choice...

THE SIX FOUR SUPPIES COMPANY is the premier independent mail-order supplier of products for the Commodore 64. Shop by mail-order in confidence — and experience the kind of service enjoyed by thousands of regular customers in the UK, Europe and as far afield as Fiji. We can provide anything from our catalogue of over 1500 items of recreational, educational and business software just some of which is listed here. (New catalogue 50p and large SAE but free with updates to customers. Ideal for checking your software collection! Get on our mailing list now!)

SPECIAL OFFER: BUY TWO GAMES AND KNOCK A £1 OFF THE PRICE OF THE SECOND! BUY THREE GAMES AND KNOCK £2 OFF THE THIRD AS WELL! (Offer closes end of January 1985.)

Please add 50p P&P for orders under £20 (Europe £1 each item, airmail at cost). Make cheques/POs/MOs payable to THE SIX FOUR SUPPLIES COMPANY.

LEISURE

3 Deep Space	c	7.95
3D Lunar Attack	c	7.95
3D Silicon Fish	c	5.95
3D Timetrek	c	5.95
3D Tunnel	c	7.95
Activision Pencil	c	11.99
Adventure Quest	c	9.95
Adventure Quest	d	11.95
Adventureland	c	9.95
Aegean Voyage	c	9.95
African Safari	c	7.95
Agent USA	c	7.95
Ah Diddums	c	5.50
Aircraft	c	7.95
Alf in the Caves	c	9.95
Alice in Videoland	c	9.95
Alice in Videoland	d	12.95
Alien	c	9.95
Ambush	c	7.95
American Football	c	9.95
American Football	d	11.95
Ancipital	c	7.50
Ancipital	d	9.50
Android II	c	6.90
Annihilator	c	5.99
Annihilator 2	c	7.95
Ant Attack	c	8.95
Alphabet Zoo	c	9.95
Aquanaut	c	7.00
Aquanaut	d	9.00
Aquaplane	c	7.95
Arcadia	c	5.50
Armageden	c	6.90
Armagedon	c	7.95
Astro Chase	c	8.95
Astro Chase	d	10.95
Astronomy	c	7.95
Attack of Mutant Camels	c	7.50
Auf Wiedersehen Pet	c	6.95
Automania	c	7.95
Avenger	r	11.99
Aztec Challenge	c	8.95
Aztec Challenge	d	12.95
B C Bill	c	5.50
Ballooning	c	9.95
Bananadrama	c	7.95
Bath Time	c	7.95
Battle at Edge of Time	c	5.50
Battle Through Time	c	7.95
Battle For Midway	c	9.95
BC's Quest For Tires	c	9.95
Beach Head	c	9.95
Beaky & The Egg Snatcher	c	5.50
Beam Rider	d	14.99
Beamrider	c	9.99
Bear Bovver	c	6.95
Bingo	c	6.95
Bird Mother	c	7.95
Birds	c	7.95
Bitmania	c	7.95
Black Hawk	c	7.95
Black Knight	c	7.95
Blagger	c	7.95
Blue Max	c	9.95
Blue Max	d	12.95
Blue Moon	d	8.95
Blue Moon	c	6.50
Blue Thunder	c	6.95
BMX Stunts	c	7.90
Break Dance	c	8.95
Break Dance	d	11.95
Caverns of Silac	c	7.00
Caverns of Silac	d	9.00
Chartbuster 64	c	9.95
China Miner	c	7.00
China Miner	d	9.00
Chinese Juggler	c	6.90
Choplifter	r	29.95
Choplifter	c	9.95
Choplifter	d	12.95
Chuckie Egg	c	7.90
City Attack	c	6.95
City Attack	d	9.95
Classic Adventure	c	6.95
Cliff Hanger	c	7.95
Clowns	r	11.99
Cluedo	c	12.95
Colossal Adventure	c	9.95
Colossal Adventure	d	11.95
Colossus Chess	d	12.95
Colossus Chess 20	c	9.95
COM 64 Forth	c	14.95
COM 64 Games Pack	c	14.95
Combat Lynx	c	8.95
Computer Studies	c	9.99
Conflict	c	14.95
Contract bridge	c	9.95
Cosmic Cruiser	c	5.50
Cosmic Split	c	7.95
Counter Attack	c	6.50
Crazy Ballons	c	5.95
Crazy Caveman	d	8.95
Crazy Caveman	c	6.50
Crazy Kong 64	c	7.00
Crazy Kong 64	d	9.00
Creators Revenge	c	6.95
Crossword Twister	c	5.75
Cuddly Cubert	d	9.00
Cybertron Mission	d	9.95
Cybertron Mission	c	6.95
Cybotron	c	7.95
Cybotron	d	9.95
D Thompson's Decathlon	c	7.90
Dallas Quest	d	14.95
Dance Fantasy	c	9.95
Danger Mouse Black Forest	c	7.95
Danger Mouse Double Trouble	c	7.95
Daredavil Dennis	c	7.95
Davids Midnight Magic	c	9.95
Davids Midnight Magic	d	12.95
Decathlon	c	9.99
Decision Maker	c	19.95
Dragonnders of Pern	c	8.95
Dragonnders of Pern	d	11.95
Drelbs	c	9.95
Dungeon Adventure	d	11.95
Emerald Isle	c	9.95
Emerald Isle	d	11.95
Fahrenheit 451	d	19.95
Fighter Pilot	c	9.95
Flyer Fox	c	9.95
Forbidden Forest	d	12.95
Forecaster	c	19.95
Forecaster	d	24.95
Forest of Doom	c	7.95
Fraction Fever	c	9.95
Frantic Freddie	c	8.95
F15 Strike Eagle	c	14.95
F15 Strike Eagle	d	14.95
Hard Hat Mack	c	9.95
Hard Hat Mack	d	12.95
Henry's House	c	8.95
Hover Bovver	d	9.50
Hunchback II	c	7.95
Impossible Mission	c	8.95
Impossible Mission	d	11.95
Interview	c	7.95
Interview	d	9.95
Jack Attack	r	14.99
Jet Power Jack	c	7.95
Jungle Quest		
Kong Strikes Back	c	7.95
Legend of Knucker Hole	c	9.95
Loderunner	c	9.95
Loderunner	d	12.95
Lords of Time	d	11.95
Lunar Outpost	c	8.95
Lunar Outpost	d	11.95
Mastermind	c	12.95
Monopoly	c	12.95
Motocross	c	7.95
Murphy	c	7.95
Music Com/Poger/ Lazarian/Clowns	r	14.95
Mutant Monty	c	6.95
My Chess II	d	11.95
My Chess II	c	8.95
One-on-One	c	9.95
One-on-One	d	12.95
Pitstop	c	8.95
Pitstop	d	11.95
Pyjamarama + Automania	c	12.95
Raid on Bungeling Bay	c	9.95
Raid on Bungeling Bay	d	12.95
Raid over Moscow	c	9.95
Rendezvous with Rama	d	19.95
Return to Eden	d	11.95
Revenge of Mutant Camels	d	9.50
Sheep in Space	d	9.50
Silicon Warrior	c	8.95
Silicon Warrior	d	11.95
Snowball	d	11.95
Spider-Man	c	9.95
Staff of Karnath	c	9.95
Suicide Express	c	7.95
Suicide Strike	c	7.95
Tax Man	c	5.65
Tapper	c	9.95
Temple of Apshai	c	14.95
Temple of Apshai	d	17.95
The Citadel of Chaos	c	7.25
Titans	c	9.95
Thrusta	c	7.95
Tony Harts Art Master	c	9.99
Tony Harts Art Master	d	9.99
Tower of Despair	c	8.95
Water Ski 3D	c	7.95
Zaga Mission	c	7.95
Zeta 7	c	7.95

EDUCATION

3D Hypermaths	c	7.95
Active Computer Learning	c	7.95
Assembler 64	c	7.00
Assembler Develop Pack	d	29.95
Assembler Tutor	c	29.95
Assembler Tutor	d	29.95
BBC Mastermind	c	9.99
Biology	c	9.99
Biology CSE/O'Level	c	7.95
Biology O'Level	c	2.99
BMX Number Jumper	c	7.95
Caesars Travels	c	7.95
Chemistry	c	9.99
Chemistry CSE/O'Level	c	7.95
Chemistry O'Level	c	2.99
Computer Mastermind	c	12.95
Computer Studies CSE	c	7.95
Count with Oliver	c	7.95
Data 1 General Knowledge	c	1.99
Data 3 General Knowledge	c	1.99
Data 4 General Knowledge	c	1.99
Data Pro	c	9.95
Data Pro	d	12.95
English Language	c	9.99
First Numbers	c	9.95
First Steps with Mr Men	c	8.95
French	d	12.95
French CSE/O'Level	c	7.95
French O'Level	c	7.95
Fun Maths On Your Micro	c	9.99
Games Creator	c	12.95
Geography	c	9.99
German	c	12.95
German	d	12.95
German O'Level	c	9.99
Go Sprite	c	9.95
History (20th Century)	c	9.99
Identikit	c	7.95
Introduction to Basic 1	c	14.95
Introduction to Basic 1	d	14.95
Introduction to Basic 2	c	14.95
Introduction to Basic 2	d	14.95
Italian	c	12.95
Italian	d	12.95
Joffe Plan	c	9.95
Junior Word/Splits	c	9.95
Just A Mot	c	9.95
Kids on Keys	c	9.95
Kinder Comp	c	9.99
Know Your Tables	c	9.95
Learn Basic Programing	c	14.95
LOGO 1	d	34.95
Look Sharp	c	7.95
Mastermind (Films & TV)	c	1.99
Mastermind (Sport/Games)	c	1.99
Mastermind (Music)	c	1.99
Mastermind (Wine & Food)	c	4.99
Mathemetics 1	c	9.99
Mathematics 2	c	9.99
Maths (CSE/O'Level)	c	7.95
Maths O'Level	c	2.99
Mr T Alphabet Games	c	9.95
Mr T Measuring Games	c	9.95
Mr T Number Games	c	9.95
Mr T Shape Games	c	9.95
Mr T Tells The Time	c	9.95
Music Composer	r	11.99
Number Puzzler	c	4.99
Paddington Shopping Mix	c	7.95
Paddingtons Disappearing	c	7.95
Paddingtons Early Visit	c	7.95
Paddingtons Problem Picture	c	7.95
Patrick Moore Astronomy	c	9.99
Physics	c	9.99
Physics (A'Level)	c	2.99
Physics (CSE/O'Level)	c	7.95
Programmers Utilities	d	14.99
Quick Thinking	c	6.95
Quizmaster	c	9.99
Robert Carriers Menu	c	9.99
Simons Basic	r	45.00
Simons Basic Extension	c	19.95
Simons Basic Extension	d	19.95
Spanish	c	12.95
Spanish	d	12.95
Spellbound/Beseiged	c	9.95
Spellbound/Open Sesame	c	9.95
Spritemaker 64	c	6.95
Star Seeker	c	9.95
Start Prog with Gortek	c	12.99
Starter Word/Splits	c	9.95
Text Pro	c	9.95
Text Pro	d	12.95
The French Mistress A	c	8.95
The French Mistress B	c	8.95
The German Master A	c	8.95
The German Master B	c	8.95
The Spanish Tutor A	c	8.95
The Spanish Tutor B	c	8.95
Time Traveller	c	9.95
Tiny Tutor 64	c	9.95
Tiny Tutor 64	d	11.95
Up an'Add Em	c	9.95
Wine & Food	c	1.99
Word Feud	c	7.95
Word Wobbler	c	7.95
Wordpower	c	9.95

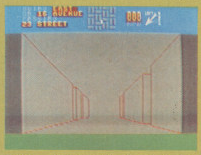
BUSINESS & HOME

Accountants Time Records	d	9.99
Advertiser	c	6.99
Calc Result 64 (Adv)	r	95.00
Calc Result 64 (easy)	r	47.50
Cash Book	d	9.99
Club Membership	d	9.99
CPM Cartridge	r	50.00
Diary 64	r	29.00
Easy File	d	45.00
Easy Script	d	65.00
Easy Spell (UK)	d	45.00
Easy Stock	d	70.00
Estate Agency	d	9.99
Future Finance	d	70.00
Gemini Business Pack	c	24.00
Gemini Horne Pack	c	24.00
Home Office 64	c	14.95
Inventory 64	d	27.00
Job Costing	d	9.99
Label Printer	c	6.99
Magpie 64	d	99.00
Micro Magpie	d	39.95
Micro Swift	c	19.95
Micro Swift	d	19.95
Micro Wordcraft	d	24.95
MON 64	r	39.95
Petspeed Basic Compiler	d	47.00
Poster Printer	c	6.99
Practicalc 64	c	35.00
Practicalc 64	d	38.00
Practifile 64	d	38.00
Purchase Day Book	d	9.99
Quadrillion	d	14.95
R Nest	c	6.95
Sales Day Book	d	9.99
Solicitors Time Records	d	9.99
Stat 64	r	29.00
Stock Records	d	9.99
Supabasic	c	9.95
Supabasic	d	9.95
Superbase 64	d	88.00
Superfont 40	c	6.95
Travel Agency	d	5.99
Word Wizard	c	6.99
Wordcraft 40	c	85.00

SOFT★HITS

What an old banger

Oh dear, oh dear. Having commented before on how computer games based on films and TV shows tend to be disappointing, my claims are borne out by this unremittingly dreadful version of Automan, the failed American TV series screened here a few months



back. Automan is a holographic projection used by a police scientist as a super crime fighter. Playing this game made me feel pretty transparent too.

How can I convey the yawning gulf between the hype for this game and the dire reality? Start with an introductory screen looking like a fourth rate Manic Miner, then proceed into a scenario of mind-numbing banality dealing with a mad bomber on the loose. Add as the final touch a main game sequence which looks like some ancient Spectrum 3-D maze game, and you have the entirety of Automan. How on earth did Bug Byte get saddled with this crashing disaster?

Program: Automan, 64
Supplier: Bug Byte
Price: £9.50!
Graphics: ★★★
Sonics: ★★
Gameplay: ★★

A lovely war

Front Line is nothing to do with the arcade game of the same name, but is a jolly good warmongering romp all the same. You control a little tank wandering around an island landscape seen from above. The details are colourful and the scrolling exceptionally good.

As you wander around looking for fuel supplies, you must fend off attacks from planes, helicopters and roving fireballs. Fuel supplies and armour strength are replenished by finding a supply dump.

Firing is quite tricky to master, since you must press the joystick button to shoot and release it at the right moment to detonate the shell when it's over the target.

If there's anything more to the game I haven't found it, so it remains a graphically engaging but ultimately pretty average offering. Note though the stirring martial music by Chris Cox.

Program: Front Line, 64
Supplier: Interceptor
Price: £7.00
Graphics: ★★★★★★★
Sonics: ★★★★★★★
Gameplay: ★★★★★

Don't rock the boat

Back to the sports theme, and an offering from the promising New Generation, whose **Cliff Hanger** was reviewed last month. The self-explanatory **Shoot the Rapids** is a canoeing simulation with smooth-scrolling graphics which demands a good deal of practice to turn in a satisfactory performance.

Like slalom skiing, the

object of the game is to pass through a series of gates in a set time. The canoe is controlled by setting up a steady left-right rhythm with the joystick or user-definable keys. This propels you forward, hopefully through the gates. Should you run into trouble — or the bank — pressing the fire button enables you to paddle backwards.

Penalty times are added if you miss a gate, and it can be very difficult to steer through them without bashing into the bank, in which case you sink without a trace.

Additional features include varying water speeds, the occasional rock or motor boat, and curious beavers.

An original and challenging offering, which could perhaps have been improved with a two-canoe option.

Program: Shoot the Rapids, 64
Supplier: New Generation
Price: £7.95
Graphics: ★★★★★
Sonics: ★★
Gameplay: ★★★★★★★

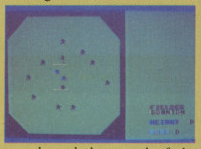
Googlies

Cricket is normally such a stupefyingly tedious game that putting it onto a computer could only improve it, if only by shortening the time of play.

Tim Love's version for the 64 is an excellent attempt to capture the skill of cricket without the accompanying boredom. There's a wide range of player-defined variables; team names, team members, members' skill levels, play level and so on. All these are selected by the joystick which is necessary to play the game.

The action takes place in two parts; a large scale animation which shows the bowler's delivery and gives the batsman a chance to respond, then a panoramic screen in which the players can control the runners and the fielders.

The animation is good, although I miss the roar of the



crowds and the sound of the steel drums — the sound effects are minimal. Still, it's nice to see a game which can be played by one player against the computer, or by two players using two joysticks. Cricket fans will love it, and unbelievers may even be converted.

Program: Cricket, 64
Supplier: Peaksoft
Price: £8.95
Graphics: ★★★★★★
Sonics: ★★
Gameplay: ★★★★★★

SOFT★HITS

SOFT★HITS

Time buggy?

A neat combination of two popular arcade games, **Time Pilot** and **Moon Buggy**, **Battle Through Time** doesn't offer anything much new but it's a nice little package nonetheless.

You control a fighting vehicle through several time zones, each one of which features a conflict which will determine the course of human history. In each one your buggy, which can shoot upwards and forwards, must fight off enemy air attacks while destroying obstacles and jumping over potholes. In each time zone you must travel ten miles to the next transporter.

You'll have to do very well to avoid the bombs, potholes and obstacles consistently enough to get through any one zone without losing a couple of buggies. Although the sprites are fairly unexciting, they zoom around the screen quite

energetically, and by the time you've progressed through WW1, WW2 and Korea you'll have to concentrate very hard.

A few little extras like a rousing rendition of Beethoven's 5th and an original form of high-score table make **Battle Through Time** just that little bit better, but it would have been nicer to see the effort put into a more original game.

Program: Battle Through Time, 64
Supplier: Anirog
Price: £7.95
Graphics: ★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★

Darkest Africa

This is the type of game the likes of which I would like to see more of, he said ungrammatically. It combines arcade and adventure features, so you get all the interest of interacting with the computer without the tedium of reading reams of text describing the usual Goblin's Dungeon.

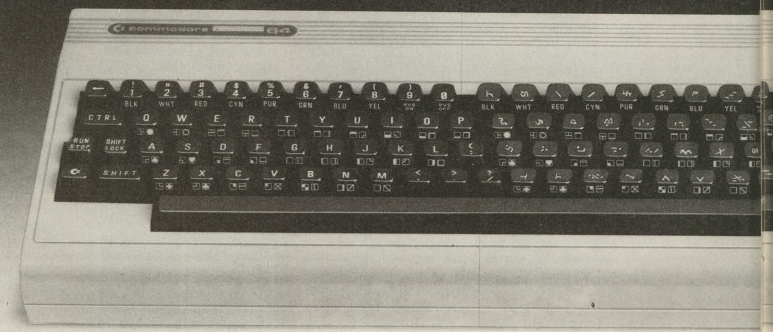
Like a traditional adventure, each scene is described in a few lines of text at the top of the screen, and on the bottom is the interactive section where

your input comes up. The graphics section in the middle shows your main character, Dr Livingstone, who can be controlled by a joystick and typed inputs of the usual verb-noun type. The animation is very well thought out — Livingstone even blinks and nods his head on cue.

The usual kind of adventure problem comes up — how do you get the canoe's paddle, which has a snake on it? How do you choose which native guide to recruit? And how do you see in the night? It's easy to fall into the various traps — no light and the animals get you — and on your quest for the lost Kenya Diamond there are plenty of dangers. With its fascinating combination of ideas and relatively original theme, **African Safari** has a good deal to offer all games players. Mind the crocodiles don't get you.

Program: African Safari, 64
Supplier: Simulated – Interdisc
Price: £7.95
Graphics: ★★★★★★
Sonics: ★★★
Gameplay: ★★★★★★

The answer to your pro



That's one answer, here's a more practical one – BREDEN'S BASIC

Much as we all love the Commodore 64 for playing games or running our business software on, when it comes down to the nitty gritty of learning more about the computer and doing some programming, there is much room for improvement.

That is why we created **BREDENS BASIC**:– it may not be the only extended basic around, but after reading the following information we are sure it is the only one you'll buy.

BREDENS BASIC – the Essential Extended Basic for the Commodore 64 incorporating High Resolution Colour Graphics, Structured Programming Techniques, Multi-Colour Graphics, User Defined Character Graphics, Music and Sound Synthesis and Toolkit Facilities plus many other useful features.

BREDENS BASIC has more commands, 135 in all, for the programmer to use than any other Extended Basic currently available, and drives the Sound and Graphic chips to their fullest extent short of writing in Machine Code.

Whirly-birds

Zaga Mission looks very much like Dynavision's much-praised **Havoc**, having the same angled perspective and complex maze-like structure.

You have to pilot a highly-manoeuvreable helicopter through a maze of walls and buildings, in order to reach an underground power plant to carry out vital repairs. You can choose two types of control: normal, in which moving the joystick up moves the chopper up, or pilot, in which it moves it down as it would on a real helicopter. Left and right control is obvious, and the fire button controls forward speed.

Height has to be judged very carefully using the helicopter's shadow and a height gauge, otherwise you'll find yourself smashing into walls which you thought were floors, or vice-versa. Perspective in this game is very hard to judge, though I'm not sure if this is deliberate or not.

There's a fuel limit, of course, so you have to land every so often to tank up. Apart from that there isn't a great deal of tension, and **Zaga Mission** is probably most suitable for those game players who enjoy a program just because it's difficult to master, rather than being fussy about the originality or brilliance of the program.

Program: Zaga Mission, 64
Supplier: Anirog
Price: £7.95 cassette, £9.95 disc
Graphics: ★★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★

Lost aargh

You've seen the movies, you've read the books, you've bought the poster magazines and the T-shirt, now play the game. It's unfortunate that film spin-offs invariably disappoint — it's as if the producers think that they've put enough hard work into negotiating for the game rights, and they shouldn't have to make any effort towards writing the game.

There are six screens with fair animated graphics, although the sprites are one-colour and the collision detection doesn't seem very precise. Your little Indiana Jones scuttles all over the screen in search of lost treasures, threatened by wiggly monsters. Some of the logical thinking puzzles were evidently beyond my poor mentality, since I spent ten minutes on one screen with absolutely nothing happening.

Still, I expect the game will sell well, since the packaging is attractive and more patient souls than myself will probably find a good game struggling to get out inside.

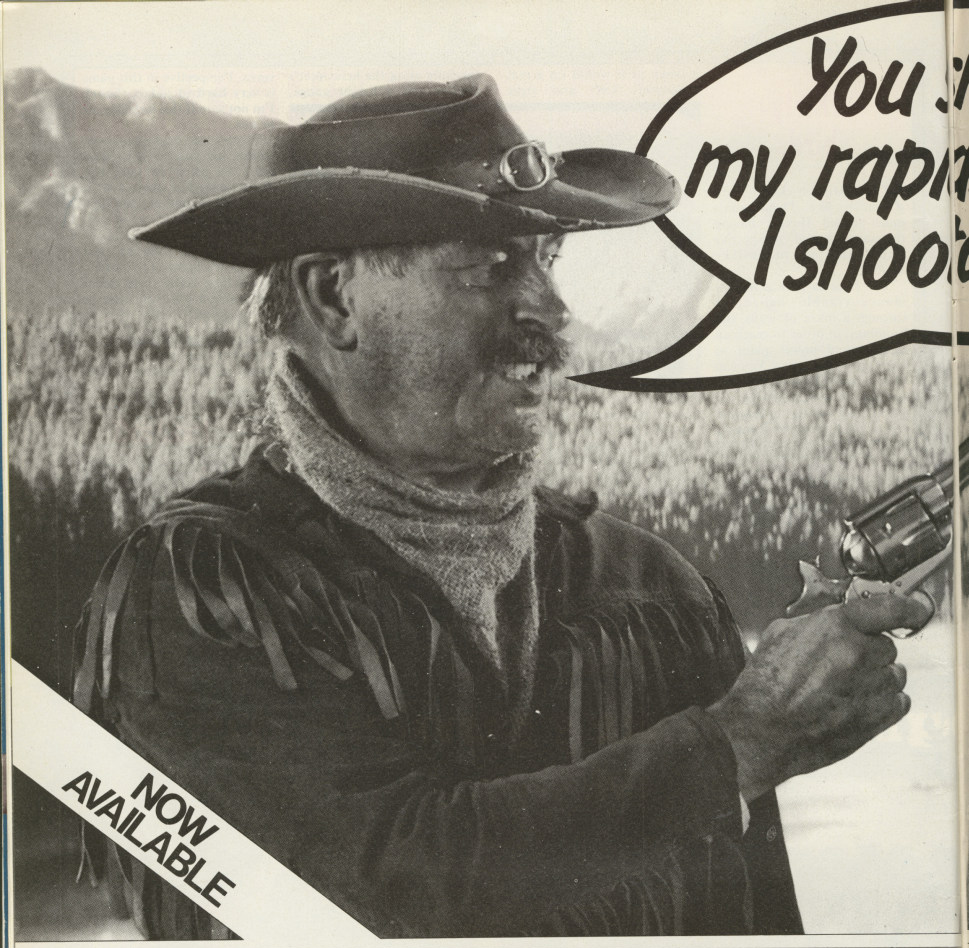
Program: Indiana Jones in the Lost Kingdom, 64
Supplier: US Gold
Price: £9.95
Graphics: ★★★★★
Sonics: ★★★★
Gameplay: ★★★★★

ogramming problems?

- Each command fully explained with example and explanation.
- Allows control of up to two joysticks or 4 paddles.
- Automatic light pen co-ordinate scaling.
- SPRITES and U.D.G's may be SAVEd or LOADed directly from tape or disc. The same is true of HI-RES GRAPHICS.
- Makes obsolete the need to calculate RAM addresses for any graphic commands.
- **BREDENS BASIC** comes with a 180pp easy to use manual plus disc and cassette in a presentation box.
- Less than 8K **BREDENS BASIC** allows plenty of room for program development.

BREDENS BASIC OFFERS
Great value for money at £39.95, a higher degree of versatility and tremendous user friendliness. All in one easy to use package.

C.S.M. (Consolidated Software Marketing). Suite 40, Strand House, Great West Road, Brentford, Middlesex. TW8 9EX. Telephone 01-560 4191.



CLIFF HANGER

AUTHOR – JAMES DAY ORIGINAL MUSIC – BRIAN DOE

Thrill to the cartoon style action of Cliff Hanger, a really original, Wild West game. As Cliff the hero, you've got to stop the bandito shooting up the canyon. But with its own brand of wacky cartoon action fun, things simply aren't as they seem in Cliff Hanger. For a start, the boulder you throw at the ol' bandito may just come bouncing back at you.

Cliff Hanger incorporates all the elements that have made New Generation games best sellers for the Spectrum, such as original ideas, superb graphics and hilarious happenings – but now it's available first for the Commodore 64.

Featuring 50 separate screens, three levels of difficulty, one or two players scoring, Hall of fame and joystick compatibility or user defined keys, Cliff Hanger is set to be **THE** Commodore games playing sensation. Available from any good software store for just **£7.95.**

Selected titles of New Generation Software are available from your local computer store and larger branches of:

John Menzies WHSMITH Boots WOOLWORTH Spectrum

Shoot the Rapids

AUTHOR – PAUL BUNN

Ever wondered what it would be like to face the fierce white water in a top class canoeist slalom run? Well wonder no more because you can enjoy the fast action thrill of competitive canoeing from the comfort of your own armchair with Shoot the Rapids.

It's a game that involves real skill because you must move your joystick to simulate paddling action. You must get through the gates of the slalom course in the fastest time possible, while avoiding the river bank and rocks. There are also extra hazards like rogue speed boats and interfering beavers to worry about.

This multi level game features increasingly difficult river courses with superb graphics and smooth scrolling along the river. Qualifying times have to be reached to move onto the next course.

With Hall of Fame, one or two player scoring and joystick compatibility, Shoot the Rapids is probably the best sports action simulation game devised to date. Available from any good software store for just **£7.95.**

New Generation Software

NEW GENERATION SOFTWARE
FREEPOST Bath BA2 4TD
Tel: 0225 316924

GSH

New Generation products are sold according to their terms of trade and conditions of sale.

SOFT★HITS

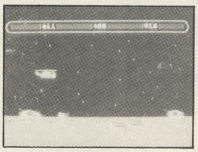
Diplomatic corpse

Choplifter was a great success in America, which says a good deal about the Americans. The scenario is quite promising: you control a heavily-armed helicopter, which takes off from a protected outpost and heads into enemy territory to rescue kidnapped diplomats.

The diplomats have broken out of their barracks and are milling around on the ground, being threatened by enemy tanks. You can bomb the tanks, land quickly, load up with 16 diplomats and take them home, then start out again.

Hazards include missile-launching aircraft, the aforementioned tanks, and aerial mines.

Having rescued one lot of diplomats, you have to blow open the next barracks and get the next lot. The tanks mill around more frantically and the aircraft swoop menacingly. But there's something missing from the whole thing — the sound effects are pathetic, for a start; have you ever heard an exploding helicopter going "Bleeeep!"? The vehicles aren't particularly well animated though the little men



scuttle around endearingly, and wave to you as they disembark.

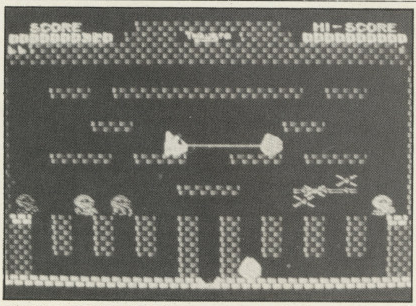
The game's shortcomings can probably be put down to its being somewhat long in the tooth, like several of the Ariola offerings. Still, it's very playable, and though it's no knockout visually, unlike for instance Virgin's Falcon Patrol 2 (which is a similar game in many ways), Choplifter will probably please a lot of games players.

Program: Choplifter, 64
Supplier: Ariolasoft
Price: £9.95 cassette, £12.95 disk
Graphics: ★★★★★
Sonics: ★★★
Gameplay: ★★★★★

Not enough thrust

Software Projects has been responsible for a good deal of excellent stuff, notably the seminal **Manic Miner.** It's difficult, then, to know what to make of this one, since it's simply a perfectly adequate little game of the type you might have expected Mastertronic to put out before they went up-market.

You control a cute snub-nosed space probe which must move around a cavern destroying alien eggs and the vicious Guardians. Your low-powered lasers aren't good



enough to zap the aliens themselves, so to knock them off you must nudge boulders off promontories and crush the little devils. Once you've zapped all the guards and crushed all the aliens, preferably before they hatch out and make your life difficult by flying around the cavern, it's on to the next screen, which is slightly faster and features different aliens and guards, although the basic layout is the same.

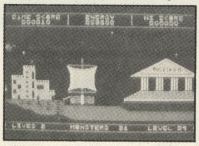
I've no idea how many levels there are, since the game doesn't hold the interest long enough to find out, but there are some nice sound effects. I wouldn't object if someone gave me a copy, but it's not the kind of thing I'd want to rush out and buy, considering that the world might end at any minute and there must be better things to do.

Program: Thrusta, 64
Supplier: Software Projects
Price:
Graphics: ★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★

Titanic

Titans, as in Ray Harryhausen's "Clash of the . . .", perhaps, since this game features many of the creatures of Greek myth and legend which crop up in the film. It's an unusual-looking game, reminiscent of some of the Atari video-game cartridges, with large chunky monsters and good colours.

You control Perseus, mounted on the winged horse Pegasus, in his attempt to reach the temple and speak



with the Oracle. As you zoom through the skies over mystic temples, open seas and monster-haunted countryside, harpies, Gorgons, lizards and cyclops try to zap you. Luckily you thought to equip yourself with a trusty Cosmic Lance before leaving home.

A great deal of dodging and zapping ensues, with smooth-scrolling landscapes and some nice effects, especially the bouncing Power Orbs which can replenish your energy if you rendezvous with them. Walking monsters require more effort to kill, and once you've zapped the lot and got through to the temple your problems aren't over — you have to climb the temple stairs avoiding rolling boulders to get to the Oracle.

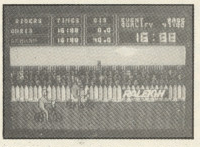
Good fun, though nothing overwhelming.

Program: Titans, 64
Supplier: Romik
Price: £7.95
Graphics: ★★★★★
Sonics: ★★★★
Gameplay: ★★★★★

Wheelies

I can't quite follow the logic behind this one. I'd have thought that people are either interested in zooming around on their BMX bikes or in staying at home and playing with their computers. I wouldn't have thought the two mixed, and so I can't believe that Hyper Biker will have much of an audience.

Still, it's a competent program, a sort of Decathlon on wheels, in which one or two players can pump their BMX bikes along, racing against the clock and competing in sprint, obstacle and jump events. You can do wheelies by hitting the



fire button, and I'm told that it's all very realistic — especially when you fall off. I don't know, I'm over 13.

Real BERM warfare, as they say.

Program: Hyper Biker, 64
Supplier: PSS
Price: £7.95
Graphics: ★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★

Learn new skills for home and business

***Mike Grace** uses his Brainpower to find new uses for your micro*

I'M SURE this doesn't happen to you, but I still find, even today, that my non-computer friends gaze with a mixture of awe and disquiet at my micro sitting quietly on my desk, screen flickering with a few paragraphs of text or a bar chart, or on certain days the latest game. "Yes," they ask, "it's all very well — but what does it *do?*"

For a year or so after buying my first computer, (a Vic 20 which still works unceasingly for my children) I cherished the dream that a computer did many wondrous things for me — and I hunted for software that would prove it. Often I came away disillusioned, often I had to come to terms with the reality that a pencil and paper (and often a calculator) did things much quicker and easier.

Then came the word processor and spreadsheet and the database (I had now moved up to a Commodore 64) and at last it seemed my micro began to prove itself. Accounts could be added and changed quickly, addresses printed out, and as for the word processor — well, for a writer there's no comparison. But I was still haunted by the realisation that most people don't want to do these things anyway.

Learning

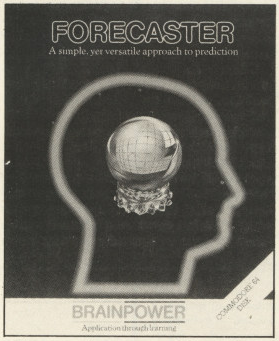
I was finally coming to terms with the fact that my computer was just more fun for me — that I didn't have to justify liking and using it — when I chanced upon some new software by a company called Triptych Publishing which has made me think again. At last it seems that someone is producing something that will be of value for people who still aren't sure what they can use their computer for. At last I may be able to look at my non-computer friends and when they ask me what it's for — I'll be able to show them.

Triptych created a series of titles based on business concepts but aimed at the home user; the three titles I bought were definitely slanted more for the business user, but other titles like **Star Watcher** and **Numbers at Work** suggest a more educational bias.

The basis of each program is a mix of learning (using traditional question and answer techniques which the computer will correct and score) and applications which you can use in your own situation. Thus you get the best of both worlds, and in my own case all three programs followed a similar pattern of a teaching section and an applications program which I could tailor for my own uses.

The three programs I tried were **Project Planner, Forecaster** and **Entrepreneur.** To be fair to all three I should point out that to get full value it would be better for me to write the review in a year's time, as they all lend themselves to in-depth study (unlike much software around), but if you take this report as a preliminary one then you will be able to judge my finding more fairly.

They were all nicely-packaged in the familiar large moulded plastic box with insets for cassette or disk plus manual. Each box has a distinctive cover showing the outline of a head and an appropriate motif inside (graph for the business-user, crystal ball for the forecaster, etc.) which shows that some thought about image and message has been taken. Below each picture is the title "BRAINPOWER — APPLICATION THROUGH LEARNING". As I opened the first one I had no idea how accurate that title would prove to be.



Forecaster is a system of forecasting or predicting the outcome of events such as future sales, share prices, and so on. It is also a method of analysing the various factors that can mean the difference between success or failure in a project.

Being computer-based the program goes heavily into the quantitative methods of prediction (this means it uses facts, statistics and numbers rather than opinions) and very quickly you are learning about things like time series, causal models and exponential smoothing. These were all concepts completely new to me, and it was gratifying to realise that I was picking it up fairly easily, which is more a reflection on the standard of teaching than my own ability.

The learning process is similar for each Brainpower program. You are provided with a manual containing well-presented examples and explanations, and a program (on tape or disk) which you load into the computer and which you use at the same time. So, for example, the manual talks about a scatter graph and the computer will draw a sample on the screen. The idea works well, being suited to the medium. At the end of most chapters there is a short exercise to test your understanding, and if you get below a certain percentage of marks a message "PERHAPS YOU SHOULD READ THIS CHAPTER AGAIN" acts as a kind reminder.

I found the theories of prediction fascinating and was soon fairly expert at five point moving averages, Holt's method of double exponental smoothing and classical decomposition (the names conjure up quite graphic ideas if you didn't know we were talking about forecasting, don't they?). One point that is possibly due to early release was that I found some mathematical errors in the section on Holt's Method (pages 22-23 in the manual) but these should be corrected in later versions of the program.

Having mastered the theory we can move on to produce our own forecast using the applications program. Here the computer asks you to complete the data and then it goes into a kind of trance for some time (the manual even tells you to go and have a cup of tea) whilst it does all the complicated sums. Finally the result comes up giving you an idea of the predictions without having to do all the complex mathematics yourself.

Being a newcomer I didn't have the opportunity to try this out myself properly, but I had a go and was rather disconcerted when the program kept telling me to use a MATRIX SINGULAR method on my example, as I have no idea what a matrix singular is and could find no mention in the glossary or index. Perhaps the mystery will solve itself on a further reading, but at the moment it remains shrouded in the depths of the 64 *(this has been revised in the new edition — ED.).*

Planner

The next program is **Project Planner** which seems more fun and is definitely easier to learn. Project Planner teaches you how to break tasks, problems, any situation into "single meaningful components" (as the blurb on the package says) and is really all about organizing your work. To the ordinary chap this might seem to be stating the obvious, but not so.

Take any task (the manual describes someone setting up a shop) and it can be divided into certain jobs that you need to do (such as finding the premises, hiring staff, stocking up, etc.). Now whilst all

these are obvious, often the best way of carrying out these tasks is not. Finding the most efficient method in the shortest time is the secret so that you can minimise effort yet maximise efficiency. For example if we think of stocking our shop, it would cost more money if it was done too soon (involving capital and increasing interest at the bank) but would lose sales if done too late.

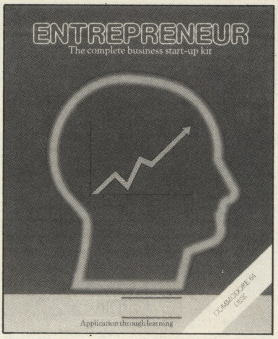
So it becomes important to know exactly when to stock the shop, what is the latest time you can do it, and what procedures are essential to ensure a smooth ride. And it isn't just in the field of business this applies, for you could be organising a school fete, planning the education of your children, building an extension on your house, etc.

The manual leads us through the pre-requisites, network planning and critical path analysis towards such esoteric concepts as free and interfering floats, once again with a simplicity that I found endearing. One aspect in this package is that the actual programming is better, (for example you can leave the program by pressing a key without having to turn the computer off), and the layout and screen colouring seemed better than in Forecaster.

Applications

Moving to the applications package the procedure is the same. Once again you enter the data and the computer does all the sums. I found the report-printing a little dodgy on my Gemini 10X (possibly an interface hassle) as I couldn't print out the bar chart, but I was able to make a print-out of a network which I set up for running a conference. If you haven't worked through the teaching section some sections would be a little hard to understand and it's a shame that on the 64 you can't print out some nice graphics (as in the manual illustrated in Figure 1) but perhaps I want too much for my money.

Finally for this article we come to



Entrepreneur — the ideal program for the person starting up their own business.

This is the most comprehensive package of the three I've seen, and really lends itself to a full review. The manual covers items such as VAT, the legality of business, the benefits of a partnership versus a Limited Company, tax advice and many other items of information essential to anyone seriously thinking of setting up any business — however small. Although this information is available elsewhere it is really easy to get to grips and understand all you need to know in the few well-presented pages in the manual.

Chapter 2 alone on Planning a Business is worth far more than the cost of the whole package, as there are 14 pages of questions you have to answer (and that means think about) concerning starting out. I found the depth of this section surprising for such a small book (and I've read a few others on starting a business) and after working through it all myself I had encountered several facts about my own enterprises which I hadn't considered before. It takes talent to write so concisely yet with depth and understanding.

The manual then moves on to discuss assets and liabilities, equity and profit, and topics such as the importance of correct cashflow. I found the explanations simple to understand, and as before the programming enhances the words. As with the other manuals simple case histories are included to clarify the concepts.

Finally there is an applications program into which you load all the information about your proposed business (or your existing one) and let the 64 do all the work. Up come the assets and liabilities and the balance sheet figures are presented for you to study. But you do need to know all your facts first.

This package is visually not so spectacular as the other two (especially the computer examples) but it seems to have a much more direct application to the small business. And come to think of it — the large business as well!

So, in conclusion, what do I think of Brainpower? As I said earlier, you *do* need to use your brain — quite a lot. The subject matter is substantial and if you're going to gain anything from the application packages you need to have done your homework first. But, in my opinion, that is one of the strengths of this series of software.

Computers aren't toys (despite the adverts which often try to tell you so) — they're amazingly powerful tools which should be helping us in our daily lives. It's a moot point whether critical path analysis and statistical information is the stuff of everyday life — but then again why not?

Capacity

The great strength of these programs is the time and effort that's gone into making quite complex ideas seem easy — and that does take skill. At £19.95 a program for the tape version and £24.95 for the disk version it compares very favourably in value with the high-priced software for most business users. But it isn't what it costs that should matter — it's what it's worth.

I've a few niggles, but they are slight. The worst error I found was the mathematical mistakes I've already mentioned in Forecaster, though Triptych promises to correct these in future editions. Other mistakes inevitably creep in, some involving very slight errors in the manual (such as calling the cursor a white box when it's blue) which are I suspect proof-reading errors in the conversion from one computer to the next. The explanations both on screen and in the manual are excellent for the first-time user.

These are well-produced items of software which succeed in being different and stretch the capacity of the machine — and (more significantly) the user, you and me. That is where the Brainpower series scores; it treats us as adults who really want to squeeze knowledge that we can apply out of our computer.

You won't find these programs a few easy minutes with your micro. You will find, if you put the time and effort into using them properly, that you have a tool that will teach you a lot and help you control your environment. ■

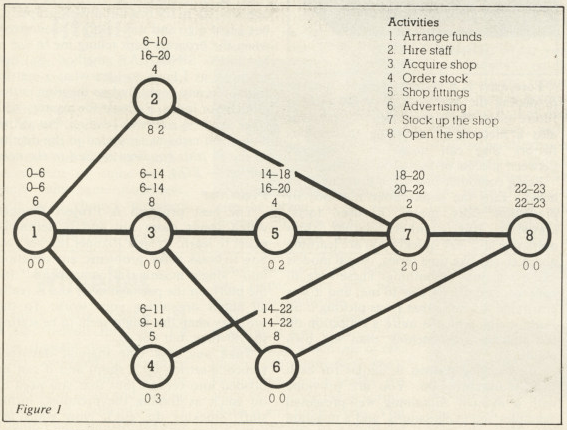


Figure 1

THE 64 SOFTWARE CENTRE
1 Princeton Street, London WC1
01-430 0954

software pricelist — prices include VAT
d = disk c = cassette r = cartridge

Accounting systems (Office use)		
Anagram Systems — Sales Ledger	d	£75.00
Anagram Systems — Purchase/Nominal Ledger	d	£75.00
Anagram Systems — Cashbook	d	£75.00
Gemini — Cashbook (with nominal analysis)	d	£64.95
Gemini — Cashbook (with nominal analysis)	c	£59.95
Gemini — Final Accounts	d	£64.95
Gemini — Final Accounts	c	£59.95
Gemini — Cashbook/VAT/Final Accounts	c	£89.95
Ramtop — Accounts Package	d	£75.00
Microsimplex — Cashbook	d	£150.00
Studio — Payroll 64	d	£34.95
Dell — Invoice generator	d	£14.95
Stock Control systems		
Practicorp — Inventory 64	d	£29.95
Gemini — Stock Control	d	£29.95
Gemini — Stock Control	c	£24.95
Anagram — Stock Control	d	£75.00
Budgeting/Forecasting systems		
Adamsoft — Budgeteer	c	£8.95
Home applications		
Handic — Diary	r	£19.95
Gemini — Home Accounts	c	£19.95
Gemini — Home Accounts	d	£24.95
Fieldmaster — Home Accounts	d or c	£19.95
Adamsoft — Checkbook Manager	d	£14.95
Database Filing Systems		
Saxon — Figaro 64	d	£86.25
Handic — Diary 64	r	£29.95
ProLine — Mailpro 64	d	£79.35
Audiogenic — Magpie	r+d	£44.95
BI — The Consultant	d	£125.00
Practicorp — Practifile 64	d	£44.50
Precision — Superbase 64	d	£87.00
Simply File	d	£69.00
Gemini — Database	d	£24.95
Gemini — Database	c	£19.95
Gemini — Mailist	d	£24.95
Gemini — Mailist	c	£19.95
Fieldmaster — Record Card	d or c	£19.95
Fieldmaster — Mail Label	d or c	£19.95
Dell — Superfile	d	£14.95

ALL IN STOCK NOW — Callers welcome
(10am – 6pm incl Saturdays)

Mail Order: Cheque or PO — add £2 for items over £20, others free Credit cards (Access/Visa): phone or write. Immediate despatch

The 64 Software Centre,
1 Princeton Street, London WC1

Please supply the following items:

1..... Qty..... @£.....
2..... Qty..... @£.....
3..... Qty..... @£.....
4..... Qty..... @£.....
TOTAL £.....
POSTAGE £.....
TOTAL £.....

Name..... Address.....
Visa/Access Card No.....
.....
Date..... Signature.....

Spreadsheets		
Hesware — Multiplan 64	d	£104.95
Handic — Easy Calcresult	r	£49.95
Handic — Advanced Calcresult	r+d	£80.00
Practicorp — Practicalc 64	d	£39.95
Practicorp — Practicalc 64	c	£39.95
Supersoft — Busicalc 1	d or c	£17.95
Supersoft — Busicalc 3	d	£70.00
Fieldmaster — Worksheet	df or c	£19.95
Practicorp — Practicalc II	d	£69.95
Statistics		
Handic — Stat 64	r	£29.95
Word Processors		
B.I. — Paperclip 64	d	£98.90
Simple — Simply Write	d	£46.00
Viza — Vizawrite 64	d	£79.95
Hesware — Heswriter	r	£39.95
Fieldmaster — Pagewriter	c or d	£19.95
Utilities		
Adamsoft — Sprite Aid	c	£6.95
Adamsoft — Ultrabasic	d	£19.95
Adamsoft — Ultrabasic	c	£14.95
Adamsoft — Chartpak 64	d	£24.95
Adamsoft — Cadpak 64	d	£35.00
Adamsoft — Superdisk	d	£12.50
Adamsoft — Graphics Designer	d	£19.95
Adamsoft — Zoom Pascal	d	£29.95
Audiogenic Monitor	r	£29.95
Audiogenic — Forth 64	r	£29.95
Hesware — Forth 64	r	£59.95
Crystal — Zeus 64	c	£9.95
Handic — Mon 64	r	£39.95
Handic — Forth 64	r	£34.95
Handic — Graf 64	r	£29.95
Fieldmaster — Poster Printer	c	£21.95
Commodore — Simons Basic	r	£47.50
Kuma — BC Basic	r	£57.50
Practicorp — 64 Doctor	d	£19.95
Supersoft — Master 64	d	£71.30
Supersoft — Victree	r	£56.35
Supersoft — Mikro Assembler	r	£59.80
Jetpack compiler	d	£39.95
Jetpack compiler	c	£14.95
Koalapad touch tablet	r	£89.95
Quicksilva — Doodle	d	£14.95
Talent — Panormama	d	£17.95
	d	£19.95
Simulations		
Flight simulators		
IFR — Flight simulator	d	£27.00
Microprose — Solo Flight	c	£14.95
Sublogic — Flight Simulator II	d	£40.00
Supersoft — Interdictor Pilot	d	£19.95
Supersoft — Interdictor Pilot	c	£17.95
Microprose — Spitfire Ace	d	£12.95
Microprose — Spitfire Ace	c	£9.95
War		
Microprose — Nato Commander	d	£12.95
SSI — Carrier Force	d	£64.95
SSI — Eagles	d	£34.95
SSI — Geopolitique	d	£39.95
SSI — Baltic 85	d	£49.95
SSI — Battle for Normandy	c	£14.95
Broderbund — Operation Whirlwind	d	£44.95
Business		
Bluechip — Tycoon (Commodities)	d	£50.00
Bluechip — Baron (Real estate)	d	£50.00
Bluechip — Millionaire	d	£50.00

Double or quits — the micro gamble

*A report on the Las Vegas Consumer Electronics Show by **Chris Jenkins** — where the C16 and Plus/4 have bust, can the C128 and LCD turn the trick for Commodore?*

EACH YEAR the Winter Consumer Electronics Show is held in Las Vegas, and the Summer show in Chicago. Traditionally, the shows are a chance for the major computer manufacturers to preview their wares, both to excite media interest and to assess the reaction from software manufacturers and dealers.

Monopoly

Commodore's enormous Las Vegas stand emphasised once again the company's importance in the small computer field, but, despite the usual confident press statements, things were not looking good for two of the latest products, the **C16** and the **Plus/4**.

Not one independent software manufacturer was showing programs for the C16 or Plus/4. The Plus/4 has not been marketed at all in the US, perhaps because IBM and Apple have monopolised the "serious applications" market to such an extend that the limited Plus/4 couldn't attract buyers. The C16, touted as a "first computer", has had a limited degree of success, but apparently has suffered in comparison with the cut-price Atari machines.

The future of the Plus/4 and the C16 now looks dubious, despite the C16's relative success in the UK over Christmas. Commodore's US marketing manager, Frank Leonardi, commented that the machines would have to be "repositioned in the market" — perhaps a euphemism for being discontinued.

The Commodore 64, meanwhile, remains the flagship of the Commodore fleet. A price cut to around $149 is on the way — a further indication that the C16 is not thought to be worth supporting — and there was a good deal of software support evident from companies large and small.

Exciting

The big news, however, is the launch of two new and exciting Commodore personal computers, the **C128** and the lap-held **LCD**.

The C128, if it comes into production in the form previewed at the show, is certainly Commodore's most exciting product yet. It operates in three modes which make it ideal for games, small business and fully professional applications.

The first mode, C64, is fully compatible with the Commodore 64. All 64 software and hardware can be used, a feature which guarantees that C128 users will have an enormous base of useable software as soon as they purchase the machine. It's the first time Commodore has introduced a micro which is "back-compatible" with a previous product, and it's a move which should protect the future of the Commodore 64 for some time to come.

In C128 mode, the machine runs a new version of Basic, 7.0, which has over 140 commands, statements, and functions, including all those from the CBM64 and the C16-Plus/4. The 128K RAM is expandable to 512K using an external RAM disk option. The 8502 processor used in C128 mode is a compatible variant of the 6502, which features 48K ROM.

An exciting extra for word processor users is the addition of switchable display modes; 40 columns by 25 lines or 80 columns by 25 lines.

For business users, the third operational mode of the C128 is the most exciting of all; CP/M mode.

CP/M, one of the most popular business operating systems, uses a Z80 processor like that found in the Sinclair Spectrum and many other non-Commodore computers. It's not new technology, but it's new to Commodore users. The Commodore CP/M mode supports the optional CP/M fast disk drive operating system.

Inspired

Taken as a whole, the C128 seems an inspired design which can perform as all things to all men. It protects the future of the 64 and its millions of users, offers the possibilities of much more powerful programs and an even better Basic, and has a great deal to offer the serious user — much more so than the ill-conceived Plus/4. As a direct competitor to the IBM and Apple personal computers, the C128 could be a winner if it offers value for money — though no-one would be foolish enough to put an estimate on its retail price yet. It's due for release in the

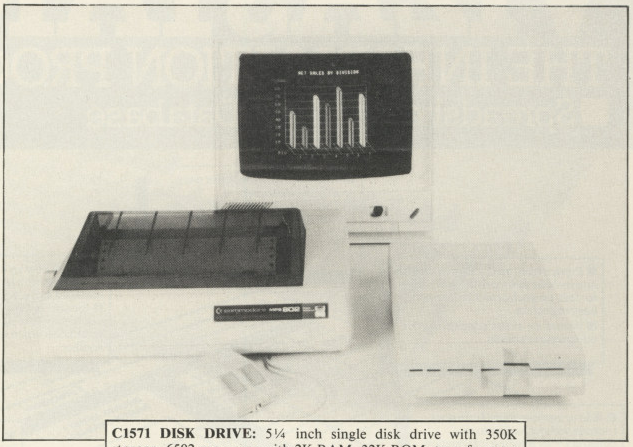
spring, as is the lap-held LCD.

The LCD is a portable designed for on-site use in a number of applications; word processing, calculation, data storage, memoranda, and communications through the built-in 300 baud modem. There are eight built-in software packages and a flip-up 80×16 LCD display. The processor is a 65C102, running Basic 3.6 with full compatibility with all Commodore 64 serial peripherals — so you could, for instance, type a report on the train then print it out back in the office. Aimed to compete with machines like the Radio Shack (Tandy) 100, Epson PX-8 and NEC PC8401A, the LCD will certainly find a market if the software is stimulating.

The new 1571 5¼ inch disk drive is compatible with both new machines and the 64, and has a storage capacity of 350K. It incorporates CP/M routines and its own 6502 processor with 32K ROM and 2K RAM. Data transfer rates vary between machines — 300 cps with the 64, 1500 with the 128 and 3500 under CP/M control.

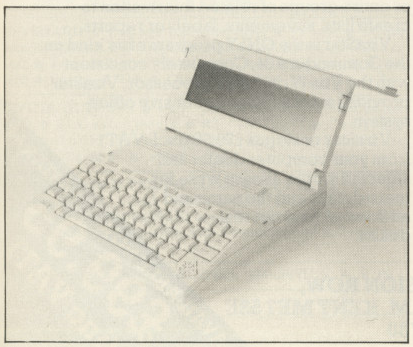
There was no sign at the CES of production models of the 16-bit IBMPC compatible computer, but a privileged few were shown an advanced version of the machine in private. There are still no firm release dates, but Commodore hopes to show a version in the UK soon. Again, no further details on the Amiga Lorraine emerged, but Commodore repeated claims that the machine was on schedule.

NEW COMMODORE PERIPHERALS



C1571 DISK DRIVE: 5¼ inch single disk drive with 350K storage, 6502 processor with 2K RAM, 32K ROM, transfer rates from 300 to 3500 cps. Compatible with CBM64, C128, LCD.
C1902 RGB/COMPOSITE COLOUR MONITOR: RGB mode, 80 characters by 25 rows, 200 total characters, 5×7 matrix; composite mode, 40 by 25, 1000 characters, 6×7 matrix. 13 inch screen, brightness, tint, contrast, volume and horizontal position controls. CBM64, C128 compatible.
MPS 802 PRINTER: Bi-directional 8×8 dot matrix printer, full PET graphic characters, numerals and symbols, tractor feed, 60 cps, 80 column width, true descenders.
COMMODORE MOUSE: Input device similar to that on the Apple Macintosh. Uses a rolling ball on the underside of the unit, together with a number of operation buttons, in conjunction with icon-driven software.

COMMODORE LCD PORTABLE COMPUTER



GENERAL FEATURES ● Built-in applications software ● Built-in 300 baud modem for telecommunications ● Runs on batteries or external power ● Automatic power down that saves battery life
BUILT IN SOFTWARE ● Wordprocessing ● Scheduler ● BASIC ● File Manager ● Calculator ● Monitor ● Spreadsheet ● Memo ● Pad ● Address Books ● Terminal Emulator
SYSTEM FEATURES ● 65C102 CMOS microprocessor (1MHz) ● 32K CMOS RAM ● 96K CMOS ROM ● Built-in BASIC 3.6 ● Built-in system utilities
DISPLAY ● 80 × 26 Liquid Crystal Display ● 480 × 128 resolution (graphics mode ● Upper and lower case characters
KEYBOARD ● Typewriter style ● 72 keys ● 8 programmable function keys ● 4 cursor keys
INPUTS/OUTPUTS ● Serial I/O Port ● RS-232C ● Centronics parallel port ● Modular phone jacks for direct connect modem ● Expansion port ● Bar code reader port (Hewlett/Packard compatible)
RECOMMENDED PERIPHERALS ● 1541 or 1571 single disk drive ● MPS 802 or MPS 803 printers ● All Commodore serial peripherals are compatible
DIMENSIONS ● 2.1" × 10.5" × 11.7" (H × W × D)
WEIGHT ● 5lbs. 5oz.
POWER ● 4 AA Alkaline batteries (15 power hours) ● 500 Milliwatts ● NiCad battery backup ● A/C adapter included
COLOUR ● Light beige

VIZASTAR 64

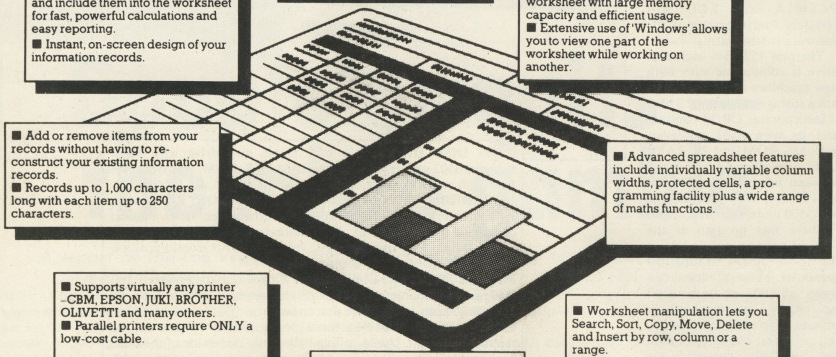
THE INFORMATION PROCESSOR

■ Spreadsheet ■ Database ■ Graphics

■ One word menu lines for easy selection of facilities.
■ The high resolution grid pattern frames the worksheet giving an easy-to read display.

■ Extract from your information files and include them into the worksheet for fast, powerful calculations and easy reporting.
■ Instant, on-screen design of your information records.

■ A 1000 Row by 64 Column wide worksheet with large memory capacity and efficient usage.
■ Extensive use of 'Windows' allows you to view one part of the worksheet while working on another.



■ Add or remove items from your records without having to re-construct your existing information records.
■ Records up to 1,000 characters long with each item up to 250 characters.

■ Advanced spreadsheet features include individually variable column widths, protected cells, a pro-gramming facility plus a wide range of maths functions.

■ Supports virtually any printer –CBM, EPSON, JUKI, BROTHER, OLIVETTI and many others.
■ Parallel printers require ONLY a low-cost cable.

■ Worksheet manipulation lets you Search, Sort, Copy, Move, Delete and Insert by row, column or a range.
■ Text editing facilities for letters, invoices, report headings etc.

■ Include information directly into the Worksheet from VizaWrite and almost any other system.
■ Simultaneous display of work-sheet and line or bar graphs.

VizaStar integrates three important electronic aids to your business or home office.
A fast and easy-to-use package – VizaStar is a comprehensive information processor that includes an electronic worksheet, information filing system and simultaneous on-screen graphics.

VizaStar has been designed to incorporate the very latest in user-friendliness – so now you can handle your all-important information in many new ways and in a quick and effective manner.

The information filing capabilities of VizaStar enable you to store your information onto disk in an ordered and instantly retrievable form. This means that you can quickly pick out individual or entire groups of related information to create lists, statements, labels or reports.

VizaStar is the ONLY program of its kind on the Commodore 64. Completely consistent with the VizaWrite word processor, VizaStar provides a totally comprehensive office system.

VizaStar costs just £99.95 (incl. VAT) from your computer dealer and selected stores. Please write for more details and the name and address of your nearest dealer.

VIZA SOFTWARE

VIZA SOFTWARE, 9 MANSION ROW, BROMPTON, GILLINGHAM, KENT ME7 5SE
TEL: MEDWAY (0634) 813780
Dealer enquiries welcome.

AVAILABLE NOW- VIZASTAR 64
£99.95 (inc VAT)

COMMODORE 128 PERSONAL COMPUTER

GENERAL FEATURES ● Revised styling ● 100% compatible with Commodore 64 ● Built-in, easy to use DOS support ● RAM expandable up to 512K RAM using RAM disk option ● Upper and lower case character set ● Built-in BASIC ● 3 separate modes of operation

64 MODE ● 6510 compatible microprocessor (1.02MHz) ● 6581 sound interface chip ● 64K RAM ● 16K ROM ● BASIC 20 ● 40 × 25 lines (320×200 resolution) ● 16 colours + 8 sprites

128 MODE ● 8502 microprocessor (1 or 2 MHz) (6502 compatible) ● 6581 sound interface chip ● 128K RAM (expandable to 512K using RAM disk option) ● 48K ROM + 16K ROM for DOS support ● BASIC 7.0 ● machine language monitor ● 40 × 25 lines (320×200 resolution) ● 80 × 25 lines (640 × 200 resolution) ● 16 colours + 8 sprites (40 column only)

CP/M MODE ● Z80A microprocessor (4MHz) ● C/PM™ Plus version 3.0 ● 128K RAM (expandable to 512K using RAM disk option) ● 40 × 25 lines (320 × 200 resolution ● 80 × 25 lines (640 × 200 resolution) ● 16 colours

KEYBOARD ● Full size typewriter style ● 92 keys ● 14 key numeric keypad ● 8 programmable function keys ● 6 Cursor keys ● help key ● 40/80 column key ● No scroll ● line feed ● Escape ● Tab ● Cap Lock ● Alt

INPUTS/OUTPUTS ● User port ● Serial port ● Cassette port ● 2 Game ports ● RF/TV port ● Cartridge port ● Audio input ● Audio output ● Composite Video ● Digital RGBI video

RECOMMENDED PERIPHERALS ● MPS 802 or MPS 803 printers ● 1571 single disk drive ● 1901 monochrome monitor ● 1902 digital RGBI colour monitor ● 1660 and 1670 modems ● Fully compatible with Commodore 64 software and accessories

DIMENSIONS ● 56mm ×432mm × 324mm (H × W × D)

WEIGHT ● 6lbs.6oz.

COLOUR ● Light beige

COMMODORE 1571 DISK DRIVE

GENERAL FEATURES ● 5¼'' floppy disk drive ● Supports fast data transfer rates ● Two serial ports for adding peripherals ● Software disk format selectable ● Comes with serial and power cables ● Compatible with Commodore 128, 64, Plus/4 and LCD computers

SYSTEM FEATURES ● Built-in 6502 microprocessor ● 2K RAM ● 32K ROM ● Built in DOS ● High data transfer rates ● 300 cps under C64 control ● 1500 cps under C128 control ● 3500 cps under CP/M control ● Up to 4000 cps burst rate

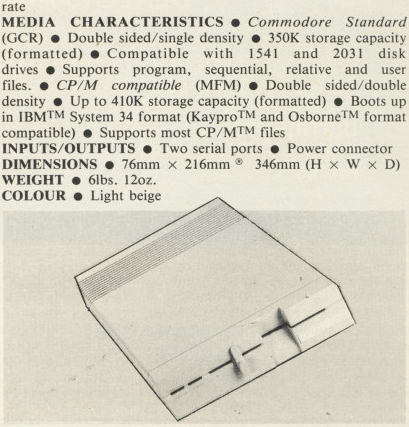
MEDIA CHARACTERISTICS ● *Commodore Standard* (GCR) ● Double sided/single density ● 350K storage capacity (formatted) ● Compatible with 1541 and 2031 disk drives ● Supports program, sequential, relative and user files. ● *CP/M compatible* (MFM) ● Double sided/double density ● Up to 410K storage capacity (formatted) ● Boots up in IBM™ System 34 format (Kaypro™ and Osborne™ format compatible) ● Supports most CP/M™ files

INPUTS/OUTPUTS ● Two serial ports ● Power connector

DIMENSIONS ● 76mm × 216mm ® 346mm (H × W × D)

WEIGHT ● 6lbs. 12oz.

COLOUR ● Light beige



Mirage

SOFTWARE & DISTRIBUTION

1 Sandy Road
Top Floor
Seaforth
Liverpool
L21 3TN
Tel: 051-920 9713

PROGRAMMERS

WE ARE LOOKING FOR TOP QUALITY PROGRAMMES TO MARKET IN THE UK AND ABROAD. THE PROGRAMMES MUST BE OF TOP QUALITY AND IN MACHINE CODE WITH GOOD GRAPHICS AND SOUNDS AND ORIGINAL CONCEPT. WE ARE LOOKING FOR PROGRAMMERS TO CARRY OUT WORK ON NEW MACHINES SUCH AS THE C.B.M/16 AMSTRAD AND M.S.X. WE CAN SUPPLY THESE MACHINES TO CARRY OUT WORK FOR MIRAGE. WE ARE ALSO OFFERING £500 PRIZE FOR THE BEST PROGRAMME RECEIVED BY THE END OF FEBRUARY 1985 WHICH WE WILL DECIDE TO MARKET. WE OFFER AN OUT RIGHT PAYMENT OR 10% PLUS PAYMENT OR 20% ROYALTIES. FOR MORE INFORMATION CONTACT THE SOFTWARE MANAGER HE WILL BE GLAD TO LISTEN TO ANY QUESTIONS YOU MAY HAVE.

SOFTWARE HOUSES

WE ARE LOOKING FOR TOP SELLING PROGRAMMES TO DISTRIBUTE TO OUR WIDE RANGE OF OUTLETS THROUGHOUT THE UK AND GIVE YOU A VERY FAST SERVICE TO HELP WITH YOUR SALES AND TO MAKE THE MOST OF YOUR PRODUCTS. SEND A SAMPLE COPY OF YOUR PRODUCTS WITH RATES AND TERMS FOR A FAST ASSESMENT. FOR MORE INFORMATION CONTACT THE SALES MANAGER HE WILL BE GLAD TO HELP AND ASSIST YOU.

DEALERS AND DISTRIBUTERS

DEALERS WE HAVE THE BEST SELLERS FROM THE BEST PRODUCERS; WE ALSO OFFER VERY GOOD RATES AND TERMS TO HELP YOU AND US TO ACHIEVE THE BEST SALES AND SERVICE. FOR MORE INFORMATION CONTACT THE SALES MANAGER.

DISTRIBUTERS HAVE YOU GOT THE MIRAGE RANGE ON YOUR SHELVES, IF NOT THEN CONTACT THE SALES OFFICE FOR SAMPLES AND RATES.

SALES MANAGER
T.C. SAPHIER

SOFTWARE MANAGER
C.A. SAPHIER

The Vic 20's mind at work

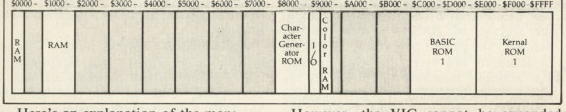
An extract from ***Raeto West's*** *definitive guide to* Programming the Vic, *looking at the micro's memory map*

THE VIC-20's memory map represents the arrangement of memory as it is seen by — in other words, connected electrically to — the 6502 chip which performs most of VIC-20's computing. Generally, this article uses the phrase memory map to refer to the 6502's map. However, note that every chip which can address memory has its own individual memory map. The VIC chip itself has another less complex memory map which is crucial in understanding graphics.

The 6502 uses 16-bit addressing and can access 2 16 = 65536 memory locations. As already noted, they are conventionally numbered 0 to 65535 (or, in hexadecimal notation, from $0 to $FFFF).

The memory map shown in Figure 1 is divided into 16 equal 4K blocks (4K is 4*1024 = 4096 bytes; this is $1000 in hex). This is a convenient subdivision. Conceptually, each block can be further subdivided into pages of 256 bytes each, with the zero page at $0—$FF, page 1 at $0100—$01FF, page 2 at $0200—$02FF, and so on. This is important because the 6502 treats pages 0 and 1 as special cases.

Figure 1



Here's an explanation of the map:

RAM from $0000 to $03FF (0-1023). This 1K block of RAM is necessary to run BASIC and has many functions, described later.

RAM from $1000 to $1FFF (4096-8191). BASIC programs have to be stored in a single continuous area of memory, so BASIC is stored here in the unexpanded VIC. The screen is also stored in 512 bytes in this region. The screen normally starts at $1E00 in this configuration (unless moved), so BASIC has only 4096—512 = 3584 bytes available.

ROM from $8000 to $8FFF (32768-36863). The VIC character sets are stored here. There are 128 characters in the uppercase – graphics set and 128 characters in lower- – uppercase set; moreover, each is duplicated in reverse. Each character definition requires eight bytes (64 bits); so the total amount of memory required for character definitions is 128*2*2*8 = 4096 bytes.

Input – Output chips occupy a total of 48 bytes. The VIC chip uses $9000—$900F, VIA 1 uses $9110—$911F, and VIA 2 uses $9120—$912F.

RAM from $9400 to $97FF (37888-38911). This is color RAM, determining the color and type of character on the screen. Only the lower four bits of each byte in this area are significant.

ROM from $C000 to $FFFF (49152-65535). BASIC and the computer's operating system are stored here. The Kernal ROM holds all the information needed for the computer to interface with the outside world, for instance through the screen and keyboard.

One drawback of the unexpanded VIC-20 is its tiny memory. VIC comes with RAM from 0 to $03FF and with 4K of RAM for BASIC from $1000 to $1FFF. Because of this, the unexpanded VIC is sometimes called the 5K VIC. However, when the screen has taken its 512 bytes from BASIC's 4096 bytes, only about 2500 bytes remain.

Memory expansion is essential for serious programming with the VIC-20. However, the VIC cannot be expanded simply by inserting RAM chips into sockets inside the machine. Cartridges have to be used; these are simple to use but far more expensive than their component chips.

There are four missing sections of the memory map, each with particular characteristics.

$0400-$0FFF. This 3K space can be occupied by RAM or ROM; RAM is usual, and both the 3K RAM expander and the Super Expander cartridge put RAM here. BASIC can now occupy an extra 3K.

$2000-$7FFF. This large area can be occupied by RAM, ROM, or by a combination of the two. Commodore's 8K RAM expander can be set to occupy any of three blocks; the 16K expander normally puts RAM from $2000 to $5FFF. BASIC can fill whatever extra RAM follows from $1FFF on. Thus, an 8K expander set to occupy $6000-$7FFF adds 8K for ML or data storage, but doesn't normally add to BASIC free memory.

$9800-$9FFF. This 2K area is the odd one out: No Commodore RAM expander fits it, and generally the area is left unused. It is not contiguous to BASIC and is therefore always an isolated are separate from BASIC. Some commercial utilities have ROM here, initialization by SYS 400000 is typical. You'll see later how a 3K RAM expander can be modified to put RAM here, and ML enthusiasts may find this area convenient for storage of routines which they wish to be protected from BASIC.

$A000-$BFFF. This is the most common location for ROM cartridges; almost all cartridge games load here. In addition, if the proper bytes are present starting at $A000, programs here will automatically begin to run when the VIC is turned on.

Reconfigured

As its memory is expanded, the VIC-20 reconfigures itself in several ways. Thus, programs written for the unexpanded VIC may not work when memory is added, even though there is clearly no lack of memory space available. For the moment, attention will focus on the unexpanded VIC, returning later to examine memory expansion in depth.

It is possible to use BASIC to PEEK all locations from 0 to 65535. In a sense, this would provide you with a memory map. Bu t it would be relatively meaningless without some further distinctions.

Program 1

```
0 DATA32,115,0,240,37,32,138,205,32,2,215,132,25
  1,133
1 DATA252,32,155,215,142,254,2,169,0,133,253,173,1
  36,2
2 DATA133,254,120,169,102,141,20,3,169,3,141,21,3,
  96,172
3 DATA254,2,136,177,251,145,253,169,0,153,0,148,15
  3,0
4 DATA150,192,0,208,239,76,191,234
10 FOR J=828TO892:READX:POKEJ,X:NEXT
```

Program 1, which works with any VIC-20 regardless of memory configuration, shows you the contents of any section of VIC-20's memory up to 255 bytes long. With it you can select a portion of memory and display its contents in black on top of the screen. Set the display to lowercase mode by pressing SHIFT and the Commodore logo key. This program is a useful investigative tool, worth typing into your VIC and saving for later use. It redisplays the selected portion of memory 60 times a second, giving for all practical ▶

purposes a continuous picture of VIC's memory. Use RUN–STOP-RESTORE to turn it off. Note that it will not operate while the cassette is in use, or with some cartridges.

Activate Program 1 with a statement of the form SYS 828,X,Y where X is the starting address and Y is the number of bytes (see figure 2).

The first example shows how the input buffer operates; nothing happens until RETURN is pressed, then an entire line is input and searched for reserved words. You can see BASIC being converted into one-byte tokens, and you can watch as invalid variable names like CONVERSION have the reserved word found.

The next example shows numbers as they are stored before being printed. It is possible to write an ML program to re-format numbers however you like, for example with a zero before the decimal point (0.5) rather than .5.

The third example shows a table which keeps track of the way VIC's 22-character lines are linked. Let the space bar repeat past the end of a few lines to watch the effect, then scroll the screen and see the links move to match.

Figure 2

SYS 828,512,88	(displays the input buffer, showing line input)
SYS 828,256,20	(displays numerals as they are formatted)
SYS 828,217,24	(shows the screen link table)
SYS 828,49310,255	(shows some ROM keywords)
SYS 828,631,10	(shows the keyboard buffer)
SYS 828,211,1	(shows the horizontal position of the cursor)
SYS 828,0,255	(displays the entire zero page)
SYS 828,36864,15	(shows the VIC chip contents)
SYS 828,37200,15	(shows the contents of a VIA chip)
SYS 828,160,3	(shows the locations which make up the VIC's clock)
SYS 828,PEEK(43)+256*PEEK(44),80	(shows how part of a BASIC program in memory is stored)

Buffer

Type in SYS 828,631,10 and press RETURN. A series of ten @ symbols should appear at the top left of the screen. Since this program POKEs values directly to the screen, and since @ is the screen representation of a zero byte, this means the keyboard buffer is empty. To show how it operates, type this short program in—0 GET X$: FOR J = 0 TO 1000: NEXT: GOTO 0—and RUN it. The delay loop allows you to queue keypresses in the buffer, and you can see the later keypresses lining up after the earlier ones.

Don't worry if you don't completely understand the examples yet; all will become clear in due time.

To see how VIC's RAM is prepared for BASIC, you need to understand certain software structures. "Looking at Memory," the program you just typed in, can help, and later on we'll present a full memory map showing how software fits into the hardware framework of the VIC-20.

There are several types of software landmarks:

Tables. These contain data, not programs, and have innumerable uses. The screen link table and ROM keywords, revealed by the previous program, are typical. The screen table is in RAM, because it has to be able to change to reflect the screen's organization; the high bit of the last character of each ROM keyword is on, making this word appear in reverse on the screen. File tables, which hold details about each currently open file, are another example.

Buffers. A buffer is a section of RAM reserved for input or output. Buffers include the input buffer, the keyboard buffer, and the 192-byte tape buffer at $033C-$03FB (828-1019), which is important when reading from and writing to tape.

Pointers. Zero page (locations 0-255) contains many pointers in the form of a pair of adjacent bytes. Information about the storage of BASIC is held in this manner. The pair of byte forms an address in standard low-byte–high-byte format. For example, locations 43 and 44 are the pointer to the beginning of BASIC program storage. On the unexpanded VIC, the normal values held in these locations are 1 ($01) and 16 ($10), indicating that program storage starts at location 1 + (16*256) = 4097 ($1001).

Vectors. These resemble pointers, as they are also pairs of bytes that constitute addresses. However, while pointers merely hold address information, vectors are used to tell the computer where to find routines to perform certain important operations. Each vector is set up to point to a routine within BASIC or the Kernal operating system when the system is turned on or reset. Altering these values enables many functions of VIC-20 to be modified. The memory examination program described earlier changes the vector to the routine which looks at the keyboard every sixtieth of a second. Sometimes ROM contains vectors; the Kernal itself is a good illustration. A jump table uses a similar appraoch, except that each address is preceded by an ML JMP instruction and therefore occupies three bytes instead of two.

Flags and temporary storage. These are programming equivalents of a jotted-down note, invariable in RAM. They keep track of a wide variety of events while programs run, ranging from whether the machine is in immediate mode to the position of the cursor on the screen.

Programs. Most of ROM is subdivided into the BASIC interpreter and the Kernal, a collection of many interrelated machine language routines. The only substantial program outside ROM is CHRGET, a routine at locations $73-$8A (115-138) which fetches individual BASIC characters. CHRGET is copied out of ROM into RAM when the system is turned on or reset. Having the routine in RAM is marginally faster than using a ROM routine. It also permits new BASIC keywords to be added to the original stock using a program called a *wedge*.

Accumulators. Several number storage areas exist in RAM: two floating-point accumulators, where numbers are added, multi-plied, and so on ($61-$66 and $69-$6E); a pseudorandom number storage area ($88-$8F); and the realtime clock ($A0-$A2). The memory examination program shows the three bytes of the clock changing, and PRINT PEEK(160)*65536 + PEEK(161)*256 + PEEK(162) is identical to PRINT TI.

The stack. The stack can't really be understood without knowing machine language. Essentially, it is 256 bytes of RAM from $100 to $1FF (256-511) that are used by the 6502 microprocessor to store temporary information, particularly information relating to subroutines. It is normally best left alone. Short machine

Figure 3

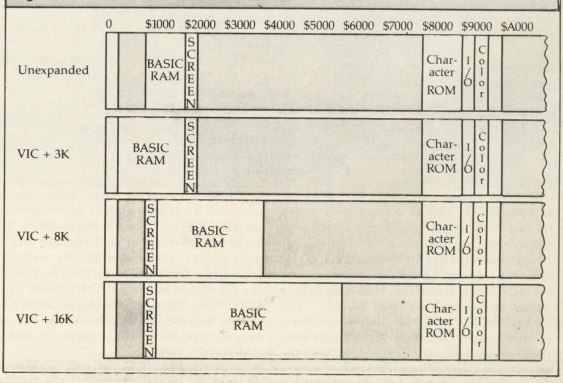


Table 1

Cartridge Only	RAM	BASIC	Bytes Free	Screen Start	Color RAM Start
Unexpanded VIC-20	$1000-$1FFF	$1000-$1DFF	3583	$1E00	$9600
VIC-20 + 3K	$0400-$1FFF	$0400-$1DFF	6655	$1E00	$9600
VIC-20 + 8K*	$1000-$3FFF	$1200-$3FFF	11775	$1000	$9400
VIC-20 + 16K	$1000-$5FFF	$1200-$5FFF	19967	$1000	$9400
Multiple Cartridges, with Expansion Board					
VIC-20 + 3K + 8K*	$0400-$3FFF	$1200-$3FFF	11775	$1000	$9400
VIC-20 + 3K + 16K	$0400-$5FFF	$1200-$5FFF	19967	$1000	$9400
VIC-20 + 8K† + 16K	$1000-$7FFF	$1200-$7FFF	28159	$1000	$9400
VIC-20 + 3K + 8K† + 16K	$0400-$7FFF	$1200-$7FFF	28159	$1000	$9400

*8K pack set to $2000-$3FFF
†8K pack set to $6000-$7FFF
Note: "Bytes free" = total RAM usable by BASIC less 512 screen bytes less 1 zero byte at the very start of BASIC.

language routines can be stored in the lower portion of the stack; if tape is in use, a safe starting location is $0140.

We'll move on now to look at the expanded VIC 20.

The BASIC memory maps for the unexpanded VIC, and for the VIC with 3K, 8K, and 16K expansion, are shown in Figure 3.

It is helpful to look at the programming side of these expanders before seeing what can be done with simple hardware modifications. RAM expander combinations are listed in Table 1. They show start and end of RAM, start and end of BASIC program storage, bytes free, the start of the screen, and the start of color RAM. Colour RAM position is related to screen position.

Expander

Note that a 3K expander, if used together with another expander, is not used by BASIC (although it can be used to store machine language or data). This is the best the VIC-20 can do, since its chip design prevents it from putting the screen below location $1000. Thus, the absolute maximum length of the BASIC program storage area is from $1200 to $7FFF, about 28,000 bytes. Also note that the *Super Expander* cartridge includes an additional 3K built-in RAM, which extends the low part of memory, so a 3K expander used with the *Super Expander* adds nothing extra.

These are the most useful combinations for BASIC. The last two configurations represent fully expanded VIC-20s. The version which includes the 3K expander can store more machine language routines or other data, but the extra 3K isn't of much use for BASIC except in unusual situations requiring a short BASIC program with a huge number of variables.

The combinations in the table aren't exhaustive, because one or more 8K expanders can be switched to create an area of RAM which is separate from the rest of RAM. Note that 3K and 16K expanders don't have this possibility unless they're modified. For example, an 8K expander set to start at $2000 adds 8K to an unexpanded VIC-20's BASIC storage area, but the same expander set to start at $A000 is independent of BASIC and never corrupted by it. It is perfectly acceptable for a RAM expander at $A000 to be loaded with a program from a ROM cartridge, which it can then run. Alternatively, VICMON can be used to write ML programs direct into RAM at $A000, although the contents of this area cannot be directly saved to tape.

If you are mixing BASIC and machine language, it is useful to have reserved RAM unaffected by BASIC, either in a 3K expander with other expansion or in an 8K expander switched to select RAM in a disconnected block.

In practice, strange things may occur when you are a fully expanded VIC, because it is easy to forget that a certain RAM or ROM device is on. For example, programs written for the unexpanded VIC often will not run on expanded VICs, so some expansion memory may need to be turned off and the equip-ment reset before those programs can be run.

Generally, any program written in VIC BASIC can run in any VIC-20 with enough memory. But it often happens that a VIC won't run a program unless its memory is reconfigured, because some element (such as BASIC's starting address) is in the wrong place. Some tape games, for example, are labelled "No RAM Expansion Necessary" when a more accurate description would be "Will Not Work With Expansion."

The problem arises because such programs assume that one particular configuration is in use, without allowing for possible differences. Often the programmer has not understood that there could be a problem. Any program which POKEs characters to the screen, changes some of the pointers to BASIC, stores its own graphics characters in some fixed location, or relies on the use of supposedly fixed locations within BASIC RAM, is liable not to run in a differently expanded VIC.

There are two distinct problems here. The first is that the VIC-20 may have expansion fitted so that a program won't run, even though the total memory includes, as a subset, what is needed to run the program. The extra memory has caused the difficulty; for example, the screen may be in the wrong place. Utility programs which autostart when the computer is turned on can also cause this sort of interference with memory. To solve this problem, either the extra RAM must be removed or the VIC must be downgraded by software.

Downgrading

In the second case, a program written for a 3K-expanded VIC may not run on one with 8K or 16K expansion, or vice versa. Again, the memory is actually in a different position from what is desired. In such cases you could acquire a 3K expander; alternately, software reconfiguration is worth a try.

Program 5-2 reconfigures the VIC in one of five ways. Downgrading is generally successful, but reconfiguring 8K or 16K expansion to run programs written for 3K expan!sion is problematical, as the program is simply moved to a new area. For example, BASIC POKEs into locations 55 and 56, which set the top of BASIC, must be removed.

The three reset routines are each useful under different conditions.

Normal reset (as though switching on): SYS 64802

Reset which preserves nonstandard BASIC: SYS 64818

Reset which ignores ROM at $A000 (for example, *Super Expander),* giving normal full memory expansion: POKE 783,181: SYS 64815

Program 2 mimics most of the features of VIC's power-on sequence, except the search for an auto-start cartridge and for the limits of RAM, which are POKEd in instead. ■

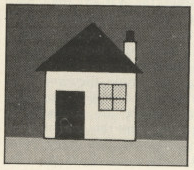
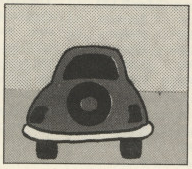
Program 2

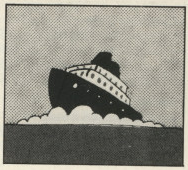
```
Ø PRINT "1. UNEXPANDED VIC": PRINT"2. VIC+3K"

1 PRINT "3. VIC+8K":PRINT "4. VIC+16K"
2 PRINT "5. TRY 3K ON 8K PACK":INPUT V
3 FOR J=1 TO V:READ B,T,S:NEXT
4 POKE 641,Ø:POKE 642,B:POKE 643,Ø:POKE 644,T:REM
  {SPACE}BASIC
5 POKE648,S:REM START OF SCREEN
7 SYS 64818:REM RESET BASIC WITHOUT TESTING RAM

8 DATA16,3Ø,3Ø,4,3Ø,3Ø:REM DATA HOLDS START OF BAS
  IC
9 DATA18,64,16,18,96,16:TOP OF BASIC
1Ø DATA 32,64,3Ø:REM SCREEN START
```

Raeto West's book *Programming the Vic* is published by Level Ltd at £10.90, and can be obtained from Biblios, Star Road, Partridge Green, Horsham, Sussex.



Going to the top of the class?

*Teacher **Phil Bonner** puts educational software to the test, and finds that some programmers just haven't done their homework*

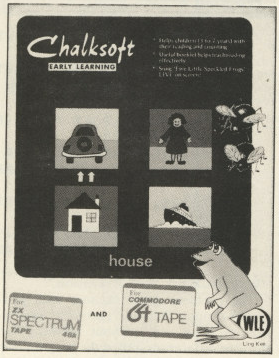
THERE IS little doubt that the majority of home computers are bought primarily for games-playing. There is equally little doubt that to use a computer only for playing games is like using a JCB only to crack eggs. A home computer is an immensely powerful tool which, particularly in terms of speed, sound and graphics, can perform many functions better than a human being.

Suspicious

When microcomputers first began to appear in offices, businesses and schools, there were many people, including teachers, who were deeply suspicious of them. Some people still are! They are wrong, but equally wrong are the enthusiasts who see the computer as the be-all and end-all. A computer cannot replace a caring parent or teacher any more than it can do away with the need for office staff. It will not go swimming, it will not dry tears and it will not cook a meal. By the same token it will not, by itself, teach geography or painting, nor impose good standards of behaviour.

So what place does the computer have in education? The teaching of Computer Studies, as an academic subject in its own right, is arguably in decline, as educators realise that the skills of programming and logic are not ends in themselves. Instead, computers are finding their way into all types of classrooms — with all subjects and age-groups — as schools use what means they have available, at a time of education cuts, to scrape together the necessary money.

The computer, together with commercial or privately-produced software, is a very potent teaching aid. It can be used with a whole class, provided a large enough monitor is available, but more often it is used with individuals or small groups of children. It is useful in remedying specific difficulties, providing practice or, more effectively, harnessing its graphic and sound capabilities to provide a new perspective on old subject-matter. It is probably at its most valuable when it injects an element of fun into mundane tasks; when the pupil learns without realising that he or she is doing so.

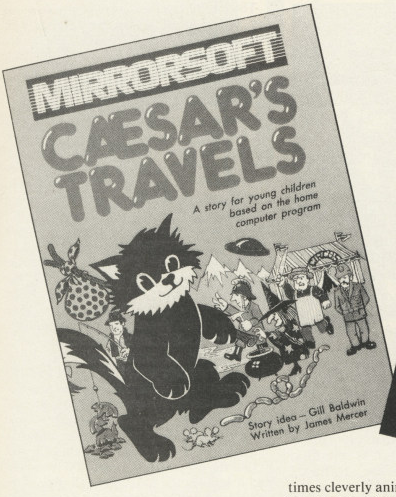


The micro can also perform these functions in the home, but it is here that dangers loom. There is a strong temptation to parents to believe that a computer will teach their two-year-old child to read, or will turn their fifteen-year-old into a future Einstein, merely by being sat in front of the screen. In fact, it is often argued that permanent damage can be caused by trying to teach a child to read too early, or by using methods which conflict with those used in school.

It is with younger children that these dangers are most apparent. For example, no computer can, by itself, teach a child to read. What it can do is reinforce the enormous amount of background work, which should be provided by parents, in the way of matching shapes, colours and sounds; describing pictures; contrasting big with small, soft with hard, and so on. Some software packages provide good documentation and guidance for parents, such as the excellent **Words and Pictures** program from Chalksoft, but with others this is sadly lacking. It is most important for parents to realise that, except in the more overtly games-type programs, their active participation is essential. The younger the child, the more important this becomes. So with a counting game, like Mirrorsoft's **Count with Oliver,** the child should be provided with toys or sweets to count and move about, as well as those appearing on the screen. Little will be gained by dumping young Johnny in front of the keyboard and leaving him to get on with it. With older children, this adult participation is still beneficial, but less crucial.

Pitfall

The other major pitfall, which besets parents and teachers alike, is knowing which software is worth buying. There are four main questions which you should ask yourself before investing in what may be a rather expensive program:



1) Does it teach anything worth knowing?

2) Does it do anything which could not be done equally well by a book or by a responsible adult?

3) Does it provide enjoyment, or is it merely stodgy and uninspiring?

4) Does it use the computer's powers of graphics, sound and almost-instant recall?

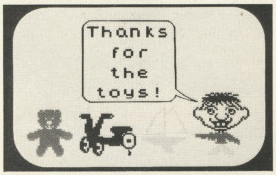
An enormous amount of educational software is available for the BBC Micro, mainly because of its Government-inspired monopoly in schools, and it is rapidly being translated for use with the Commodore 64. Much of it is excellent but some is atrocious.

Specialists

The problem of choosing suitable programs is made worse by the fact that most of them are not easily available, except by mail-order, so cannot be viewed before buying. Although some of the software produced by the smaller houses is good, it is perhaps wisest, in these circumstances, to stick to the major specialists in educational software, like Chalksoft, Mirrorsoft and Commodore itself, or to software produced by the heavyweights in educational book publishing, for example Penguin, Longman and Collins. Such companies have their reputations to consider and, generally, do not release rubbish.

Toddlersoft claims that its **Flashcards and Spelling** program is suitable for children from eighteen-months old. The program places jumbled letters on the screen, then sorts them out into words. With some words a picture appears, sometimes cleverly animated. No documentation is included. There is a facility to add extra words and to practice spelling. An infants' school headmistress, whom I asked to try the package, was quite scathing. She felt it could be of some use with early readers, but criticised it for causing confusion by superimposing letters, for not providing enough pictures and for limiting its words to seven letters.

Chalksoft's **"Words and Pictures"**, on the other hand, does much better. It provides a choice of four pictures for each word, and the user has to match the word, or a simple sentence, to the correct picture. A jumping frog rewards correct answers and, after ten questions, performs a well-known children's song, with animations. With the program comes a very helpful guidebook for parents. This is certainly one of the best programs reviewed.



"Count With Oliver", from Mirrorsoft, consists of two counting games. There is no guidance for parents but the games themselves are excellent. The child is required to count various types and colours of toys and lollipops, which appear in a shop window, and, in the more advanced game, to perform simple addition and subtraction. Colourful pictures and clear characters are used throughout, prompts are provided when required, and the difficulty of the exercises is carefully graduated. A very good package, but one which calls for considerable back-up work from an adult.

Also from Mirrorsoft comes **"Look Sharp"**, a package of two sets of memory games written by a headmaster, whose expertise shows clearly. **"Old MacDonald's Farm"** is aimed at 4-7 year olds and uses animal pictures in games of snap, of finding the odd-one-out of three pictures and recreating a scene which is displayed on the screen. The second program, S.O.R.T., contains three games to develop observation and memory in children over seven, using a space-travel theme. The games are tantalising, and in use I found them entertaining and challenging for children and adults alike — an excellent test of concentration. In all it is a first-rate package, and one of the few which could be of benefit to younger children with little supervision.

"Caesar's Travels", again from Mirrorsoft, is a fine example of a type of

game which is being recognised as particularly effective. A simulation, or adventure-game scenario is used, in which the child has to make decisions based on the antics of Caesar the Cat, from Mirrorsoft's arcade game. Choices of action are entered using the function keys, for which a clear overlay is provided. At various times the game tests shape and colour recognition, left and right, simple counting and road safety, as well as providing an excellent reading exercise. Animated graphics and sound are used to great advantage throughout. It is intended for children from three to nine years, but with the younger end of the age-range its use would be limited. An adventure-game story-book is provided with the tape, and the entire product is first-rate.

In contrast are two packages from Shards Software: **Fun To Learn** and **Monster Maths.** Both are intended for children of junior school age, and each provides a suite of simple programs. **Fun to Learn** contains a strange mixture of a counting game, an anagram game, an addition exercise, a type of space hangman and a simple letter code. Except in the hangman game the use of graphics is poor, and the games are boring. **Monster Maths** again contains five exercises, this time in mental arithmetic. In only one of these are graphics used effectively, and the others are truly deadly! It is time programmers realised that providing endless drill in multiplication tables is of little value.

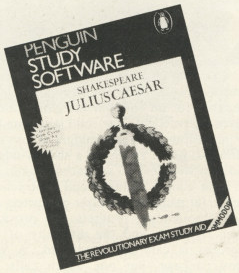
Punctuation

At the other end of the scale, **Punctuation Pete** uses the computer to excellent advantage. Published by Hill-MacGibbon, it is intended for the 7-12 age-range, but could also be of great value to older children who have difficulties with punctuation. The user moves Pete, an animated sprite, along lines of text, and uses him to put basic punctuation in the appropriate places. If it is done wrongly, Pete shows where alterations are needed, and finally corrects it himself if necessary. There is an excellent range of passages provided in graduated levels of difficulty. The only criticism I could level is that the program is rather quirky about using commas before conjunctions, but otherwise I recommend it highly. As a bonus, the other side of the tape carries a database of words linked by the theme of "travel", and hangman and anagram games which use these words. All in all it is a first-rate piece of software.

Quite the worst piece of software I have seen is **World Geography** from a company having the temerity to call itself Superior Software. At first it looks impressive, placing a high-resolution map of the world on screen, but all it does is to ask for capital cities and populations of various countries, some of them most obscure. It has a tendency to crash, it allows you to cheat by accepting any non-alphabetic key as a correct solution, and it does not tell you the right answer if you get it wrong. Worst of all, there is little value, educationally, in knowing capitals and populations anyway! Yet this program is being advertised widely, and no doubt many parents will be fooled into buying it, and its sister program, **U.K. Geography**, which is in the same vein.

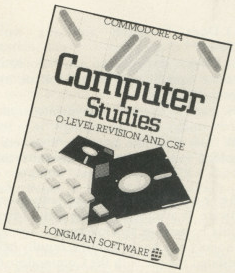
Vocabulary

The German Master and **The French Mistress,** from Kosmos Software, are examples of well-written programs which, nevertheless, fail to exploit the power of the computer. They are vocabulary-testing programs, for use with 11-16 year olds, which are quite sound but do nothing which could not be done as well without a computer, and they fail to allow for differing shades of meaning. For example, the German word "zusatzlich" means "additional" or "extra", yet the program will not accept "additional" as a valid translation. Sound and graphics are not used at all.



The best O-level software I have found is the series of Shakespeare plays from Penguin Study of Software. These are databases which provide the user with references to themes which arise in the plays, and pose questions which ought to be considered. They will also provide cross-references so, for example, it is possible to use the **Julius Caesar** tape to find references linking "Caesar" with "Ambition" in "Act 1". The programs would be useful for writing essays, for examination revision, and also as a source of ideas for teachers. I asked a specialist English teacher to try **Julius Caesar** and **The Merchant of Venice** and she was most enthusiastic.

Longman's is a highly respected publisher of school textbooks, which has released a range of O-level revision programs for the Commodore 64. I looked at three of these, in **Mathematics, Chemistry** and **Computer Studies.** All of them are quite good although, of course, they are unable to cover the whole syllabus on a single tape. Each provides coverage of four topics which pupils find difficult, and the treatment given is sensible and thorough. To my mind, the "Mathematics" tape is the poorest of those I saw, in that the on-screen presentation is untidy, and it ignores the most difficult aspects of transformation geometry. Nevertheless it is quite sound, and excellent in parts.



The Computer Studies package is particularly good, with Chemistry not far behind. All of them would be useful for O-level students, though of less use for CSE. The tapes also include databases, listing topics for revision which are not otherwise covered. These are very comprehensive, but the pupil's own notes would probably be much better.

Mushroom

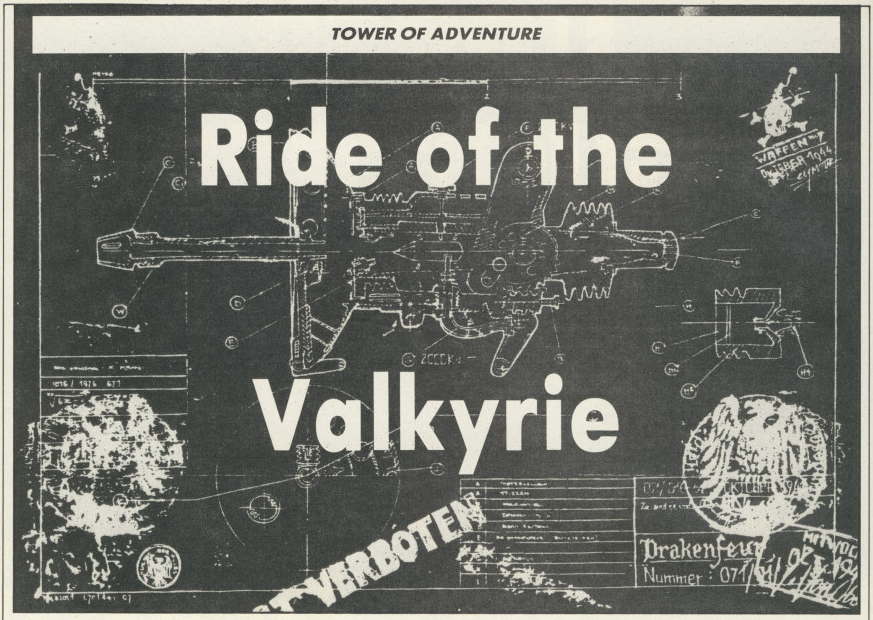
With over two hundred educational packages on the market already, it is impossible to review them all. What I have tried to do is to cover as wide a range as possible, in terms of subjects and the age-groups for which they are intended, and I have used the views of other teachers and pupils extensively. With the current mushrooming in such software, it is inevitable that some of it should be poor or indifferent. I hope I have provided readers with help in avoidng bad programs, so they will be able to use their judgement, and spend their money wisely. ■

UPPER GUMTREE

You will be!

Wotsitallabout? Don't ask us! ask your local games shop!

Ride of the Valkyrie



Secret agent Barbara Conway forsakes the lands of magic for the seedy world of conspiracy and kippers

ORIGINAL adventure plots are at a premium and the basis of RamJam's **Valkyrie 17**, although faintly reminiscent of many a "B"-movie storyline, has more originality than most plus the magic ingredient of a sense of the ridiculous. Let's face it, any adventure package based on the cryptic message "the Red Kipper flies at Midnight!" has to have at least some sense of humour.

Bondage

The plot, or least the part you're allowed to know at the start, is based on events at the end of World War II when you, the player, were an Allied secret agent. Now, years later, it seems that the top-secret "Valkyrie 17" project has been revived by Nazi sympathisers eager for world-domination. One agent has already been killed (the audio track on the tape thoughtfully gives you his last telephone message plus the shot which abruptly ends it) and now it's up to you to take up the trail from the Glitz hotel overlooking beautiful Lake Bruntz and save the world from the mysterious super-weapon.

I warn you, James Bond would probably despair over this one. Your first problem is to get OUT of the Hotel where the staff, with the exception of a friendly maid, would make Basil Fawlty's establishment look like a haven of peace and welcome. Before escaping, however, there are a number of items you must pick up whilst dodging the manager and his constant demands for the bill to be paid. You can't do this (don't try fighting with him, though, he's a deadly karate black-belt) since you have no money and an excursion into transvestism doesn't fool him for a second. Escape is possible, however, and once you've cracked that problem your troubles really begin. In my first few trips to the town and surrounding areas I was killed three times (some of the natives are really hostile and the marine life isn't a lot better) in my desperate search for the elusive Reichsmuller who (I think) is the key to the problem.

The Valkyrie scenario spreads a great deal wider than the immediate vicinity of Lake Bruntz and you may find yourself referring frequently to the clues on the audio tape as well as as the highly-confusing dossier (complete with special "Valkyrie 17" badge) with the program. There are sound effects (answering the phone at the hotel at different times can get you different messages) and many locations have graphics which may change according to your actions. A piece of early vandalism to get some equipment yields the appropriately altered picture.

I'm nowhere near solving the mystery yet but I'm having a lot of fun trying. The train to Casablanca has been a bit of a disappointment (maybe Heinrich fooled me after all) but I have high hopes of the airstrip. Red Kipper or red herring, Valkyrie's good value.

The latest offering from Melbourne House is **Castle of Terror**, a variation on the well-worn "vampire" theme. As is usual from this source, the program will accept complex multiple instructions as well as the standard abbreviations and much attention has been paid to the graphics which are described in publicity blurb as having "animated characters".

Mysterious

There are fast, detailed graphics for all locations, some of them containing an element of animation such as the fieldworkers or the drinkers in the village pub which is where you learn the purpose of your quest. Buying a gloomy old man a pint (but you've got to earn the money first) you learn that his daughter has vanished mysteriously and that the source of this, and other, local evils is believed to be the nearby spooky castle.

With accompanying music, which switches between two themes, you approach the castle after a thorough exploration of the neighbourhood including a quick, and ominous, investigation of the local graveyard.

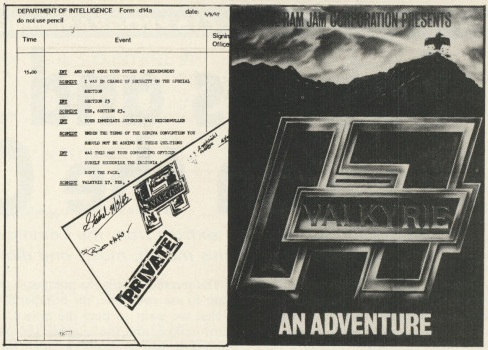
Everything about the castle, including its entrance, is potentially lethal so don't pin your hopes (I've just given you a clue) on getting in easily.

It's a good professional effort, as you'd expect from Melbourne House, but although some of the graphics are superb, I didn't find it as gripping as **Sherlock** or as entertaining as **Hampstead**. And, at least in my review copy, there were some unfortunate bugs such as the omission of any hint, in graphics or text, that the vital lantern was present at one location.

Gothic

Despite a superficial similarity of name, **Tower of Despair** from Games Workshop is a very different proposition. This is a Tolkeinesque fantasy adventure in which the player is the only hope of the world against an engaging character known as Malnor or the Screaming Shadow. This a text only game with a relatively simple instruction format, but a great deal of thought has obviously gone into preparing responses for all likely cammands. Communication is quite important in Tower so talk to everyone be they deity or chance-met travellers (no need to talk to Malnor's winged demons, though) and keep a sharp eye out for helpful items. It's not an all-time great, but I found Tower rather appealing and the screen lay-out, with a gothic-type script, is nicely done.

Animal Magic, from Romik Software, is a quest to find a baby which has been eagle-napped while your attention wandered. As suggested by the title, you meet an entire



menagerie, some of whom are potentially dangerous, as you go in search of the missing infant. None of the puzzles should stump experienced adventurers (the wild bull elephant is afraid of only one thing — and we all know what to look for, don't we?) but it's a serviceable package with sprite graphics for the animals. A bit slow for my taste.

I've been trying my hand at some of the other strategy games from Addison Wesley, but I can't repeat my brilliant success with that company's newspaper game (last month). My attempts at insurrection in **Military Coup** have been crushed with contemptuous ease by my micro, playing the tyrannical General Xerxes, and my performance as Admiral of the Fleet in **Dreadnought** (early 20th century naval battles) was fatally wet! For the more competent strategist these are good, detailed scenarios with well-planned graphics. ■

If you are having problems with a Commodore adventure program, write to Barbara Conway c/o Commodore Horizons, 12/13 Little Newport Street, London WC2H 7PP, and she will look at the most common problems in Tower of Adventure.

For work or play
Voltmace has the answer!

Made in England

For play *The delta 3sc joystick is intended for the more sophisticated user. A lightweight unit designed to be hand held and operated by the fingertips of the other hand. The rotary slide switches cannot be damaged by excess pressure on the joystick and the fire buttons (choice of three), have been tested for millions of operations.*

For work *The datapad 16c—a sixteen way full travel keypad for the CBM 64. Simply plugs into the two control ports. Complete with a cassette program to define the key characters. In operation just put on the "shift lock" to select keypad.*

DATAPAD 16c £29.95
DELTA 3sc JOYSTICK £9.95
Prices include VAT and P&P.

Send cheque or P.O. to—
Voltmace Limited
Park Drive
Baldock
Herts
SG7 6EW
Telephone (0462) 894410

Voltmace datapad 16c & delta 3sc

Callers welcome at the factory—Monday to Friday. *Dealer terms available.*

Sounds and strings on the C16

Continuing last month's extract from the Commodore 16-Plus/4 Companion
by ***Brian Lloyd*** *— this month, music and more command routines*

It is time we explored your computer's sound capabilities. Your computer has three different 'voices', and you can use any two of these together. This means that you could have one voice playing a tune and another voice playing the rhythm. Two of the voices produce tones and the other produces white noise (this is useful for explosions and gun shots).

However, before we can produce any sound we have to set up the volume level. To do this we use the VOL command, together with a number from 0 to 8 (8 is maximum VOLume, 0 is minimum, or off). It is best to set the VOLume to maximum, so type in

VOL8

Now all we have to do is to choose a voice and a note and decide how long to play it for. For instance, if we wanted to play the note C on voice one for three seconds then we would type the command

SOUND 1,810,180

The number 1 tells the computer that we want to use voice one, the number 810 tells it that we want to play the note C in the third octave, and the number 180 tells the computer that we want the note to last 3 seconds (the length of the note is in sixtieths of a second).

Try changing the 1 of the SOUND command to a 2 and then a 3 to see what the different voices sound like.

As I said before, it is possible to have two voices playing at once. You can either have voices 1 and 2 playing together, or voices 1 and 3. If you type this line you will hear a note being played over the top of white noise

SOUND 1,810,360: SOUND 3,917,360

The SOUND command can be used to play tunes and to create effects.

The computer can continue to carry out other instructions while making a sound, so you may have a tune playing in the background while something else is happening.

Doctor Foster

```
10 SCNCLR:VOL 8:PRINT"DOCTOR FOSTER"
20 FOR N = 1 TO 36:READ NOTE, LENGTH
30 SOUND 1, NOTE,LENGTH
40 NEXT N
50 FOR N = 1 TO 5000:NEXT N
60 RUN
70 DATA 739,60,739,30,834,60,834,30,810,30,834,30,810,30,798,60,
770,30
80 DATA 739,60,739,30,798,30,770,30,739,30,770,90,770,60,770,30,
739,30
90 DATA 739,30,739,30,834,30,810,30,798,30,810,30,834,30,810,30,
854,30
100 DATA 834,30,810,30,798,30,798,30,798,30,880,60,770,30,881,90,
881,60
```

Telephone

```
10 SCNCLR
20 VOL8
30 FOR M = 1 TO 10
40 FOR N = 1 TO 10:SOUND 1,650,1:SOUND 1,700,1:NEXT N
50 FOR N = 1 TO 50:NEXT N: FOR N = 1 TO 10:SOUND 1,650,1:
SOUND 1,700,1:NEXT N
60 FOR N = 1 TO 1000:NEXT N,M
70 FOR N = 1 TO 8:SOUND 1,650,1:SOUND 1,700,1:NEXT N
80 SOUND 1,920,20
90 FOR N = 8 TO 0 STEP – 1:VOL N:FOR M = 1 TO 5:NEXT M,N
```

The note table covers four octaves, but sharps and flats are not shown. The frequency of the note is given for reference only. The value shown for each note are the ones which you should use as the second number after the SOUND statement. For example, to play the note C (third note down) for half a second you would use the command

SOUND 1,173,60

NOTE	FREQUENCY (Hz)	VALUE
A	110	11
B	123.5	122
C	130.8	173
D	146.8	266
E	164.7	349
F	174.5	387
G	195.9	457
A	220.2	520
B	246.9	575
C	261.4	600
D	293.6	647
E	330	689
F	349.6	708
G	392.5	743
A	440.4	774
B	494.9	802
C	522.7	814
D	588.7	838
E	658	858
F	699	868
G	782.2	885
A	880.7	901
B	989.9	915
C	1045	921
D	1177	933
E	1316	943
F	1398	948
G	1575	957

You may play a note of nearly any frequency. If you know the frequency of the note which you require then you can calculate the value to be used in the SOUND statement using this formula

VALUE = 1024 – (110840.45/FREQUENCY)

In using GOTO and GOSUB you cannot use a variable instead of a line number with these commands. To make up for this, your computer has been supplied with the commands ON . . . GOTO and ON . . . GOSUB. These commands will GOTO or GOSUB a line depending on the value of a variable. For instance, if the computer encountered this line

120 ON ZZ GOTO 1000, 2000, 3000, 4000

then it would look to see what number the variable ZZ represents and then GOTO one of the following line numbers depending on that value. If the value of ZZ is 1 then the computer will GOTO line 1000. If the value is 2 then the computer will GOTO line 2000, and so on.

The ON . . . GOSUB command works in

```
10 SCNCLR
20 FOR N=9 TO 13:CHAR 1,17,N,"[CONTROL 5 CONTROL 9]
     ":NEXT
30 DICE=INT(RND(0)*6)+1:IF DICE=7 THEN GOTO 30
40 ON DICE GOSUB 60,70,90,110,130,150
50 FOR N=1 TO 1000:NEXT:RUN
60 CHAR 1,19,11,"*":CHAR 1,17,14," ONE ":RETURN
70 CHAR 1,18,10,"*":CHAR 1,20,12,"*"
80 CHAR 1,17,14," TWO ":RETURN
90 CHAR 1,18,10,"*":CHAR 1,19,11,"*":CHAR 1,20,12,"*"
100 CHAR 1,17,14,"THREE":RETURN
110 CHAR 1,18,10,"* *":CHAR 1,18,12,"* *"
120 CHAR 1,17,14,"FOUR ":RETURN
130 CHAR 1,18,10,"* *":CHAR 1,19,11,"*":CHAR 1,18,12,"* *"
140 CHAR 1,17,14,"FIVE ":RETURN
150 CHAR 1,18,10,"* *":CHAR 1,18,11,"* *":CHAR 1,18,12,"* *"
160 CHAR 1,17,14," SIX ":RETURN
```

exactly the same way as the ON . . . GOTO command, except that it GOes to a SUB-routine which should end with a RETURN statement, as with a normal GOSUB command.

Program Four simulates a die and uses the ON . . . GOSUB command.

Where you see the square brackets in Line 20, this indicates that you should change the text colour to purple and switch reverse on by pressing CONTROL 5 then CONTROL 9.

The program works in this way:

Line 10: Clear the screen

Line 20: Change the text colour to purple and print a solid block 5 lines deep and 5 characters wide, with the first block in the character square 17 across and N characters down

Line 30: Choose a random number between 0 and 1, multiply it by six and round it up before adding one to the result. Assign the final number to the variable DICE. If the value of the variable DICE is seven then carry out this line again (choosing a random number between 1 and 6, then adding 1 and rounding down makes it possible that a six will come up. The computer very rarely chooses the highest number possible when choosing a random number and therefore RND(0) * 6 is almost always less than seven)

Line 40: If the value of the variable DICE is 1 THEN GOTO the subroutine starting at line 60. If the value of DICE is 2 THEN GOTO the subroutine starting at line 70. If the value of DICE is 3 THEN GOTO the subroutine starting at line 90, and so on.

Line 50: Empty FOR . . . NEXT loop — causes a delay before re-running the program

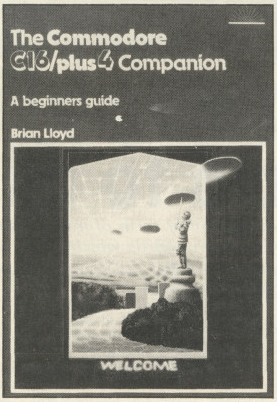
Line 60: Display a single star at the character square 19 across and 11 down then display the message ONE with the 0 in the 17th column across and the 14th row down before returning to the command immediately after the GOSUB command which jumped to this routine

Line 70: Display a single star in the character square 18 across and 10 down then display another star in the character square which is 20 across and 12 down

Line 80: Display the message TWO with the T in the 17th column across and 14th row down

All lines after line 80 are similar to 60-80 — they just display various numbers of stars.

If you are typing in a program from a book or a magazine then it can become very boring having to type line numbers, especially if the lines are numbered evenly (e.g 10, 20, 30 and so on). In order to speed



up the entry of such programs, and also to make it less boring, your computer has been equipped with an AUTOmatic line number command. If you type in

AUTO 10

and then start typing in a short program you will see that as soon as you have pressed RETURN at the end of the first line, the next line numbers will appear for you AUTOmatically.

The number after the AUTO command tells the computer how much each line number is increased by, so if you type AUTO 50 the computer will number the lines 50, 100, 150 and so on.

Once you come to the end of the program you should press the RETURN key without typing anything. For instance, if you have finished your program at line 1510 and the computer displays the next line number 1520 and waits for you to type in some more of your program you should just press RETURN without typing anything else.

In some circumstances you may need to reset all the variables in the middle of a program. The easiest way to do this is to use the CLR command. The program itself is not stopped or altered in any way.

The CLR command is carried out automatically when you alter a program line, or RUN a program.

It is often useful to be able to find out the CHR$ code for a character. Fortunately for us, your computer has a command which allows us to find out the CHR$ code for any character without having to look it up in a table. This command is ASC.

If you type

PRINT ASC("A")

You will see the number 65 appear on the screen. 65 is the CHR$ code for the A symbol. You can find the CHR$ code for any character like this, all you have to do is enclose the character in quotation marks, and enclose them in brackets, as in the above example.

The VAL command is a function which returns the value of a string variable. For instance, if the string variable BS$ had previously been set to 921 then the command.

Z = ZAL(BS$)

would assign the number 921 to the variable Z.

If there is a combination of letters and numbers in the string variable then one of two things will happen. If the string starts with a number then the value returned by the VAL command will be the value of that number (eg PRINT VAL ("A12") would return the value 0).

STR$ is the opposite to VAL, for this function converts a number to a string. For instance, if you had a line such as this

320 A$ = STR$ (864)

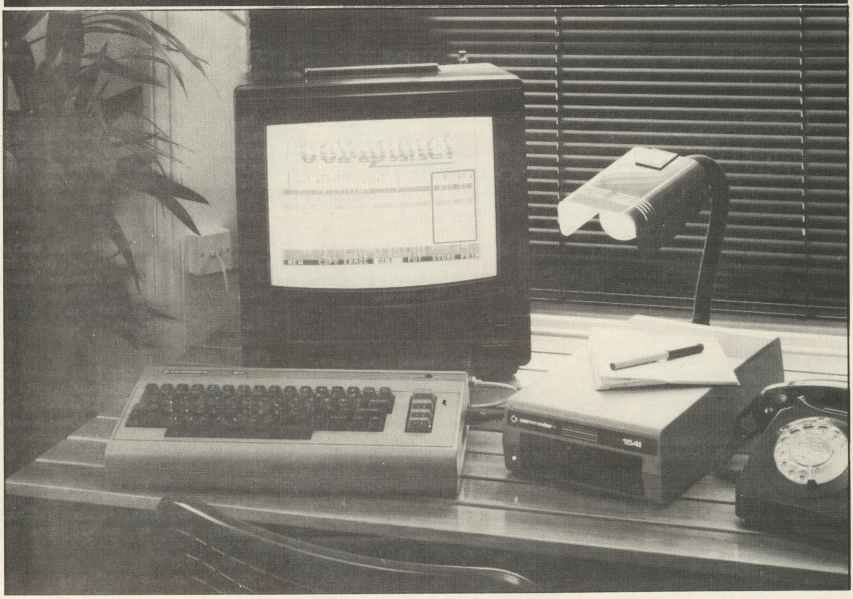
then the string variable A$ would be assigned the characters 864.

The STR$ command will always add a space before the number at the start of the string variable in which the characters are to be stored. For instance, if you entered this program

```
10 SCNCLR: A$ = STR$ (864)
20 PRINT A$: PRINT LEN (A$)
30 A$ = RIGHT (A$,3)
40 PRINT A$: PRINT LEN (A$)
```

You will see that a space has been added before the number when it was stored in the string variable A$. Line 30 effectively removes this space, and when the string is displayed a second time along with the number of characters in that string, you will see that the space has been removed.■

The *Commodore 16-Plus/4 Companion* by Brian Lloyd is published by Sunshine Books at £6.95, from bookshops or by mail order.



A two-way affair — micro to micro

***Brian Lloyd** introduces another form of micro communications — the privately operated bulletin boards which are growing in popularity*

IF YOU ARE the sort of person who believes that there must be more to home computing than playing games, then the world of micro communications may be of interest to you. When you enter the field it is like a real live adventure, trying to discover new ways of using your micro to communicate with other micros.

Bulletins

One of the best ways to start is to contact one of the many bulletin board services that are springing up around the country. However, before we look at what we need to access the bulletin board services, a few words of advice would not go amiss. Nearly all bulletin boards are run by private individuals who give up a tremendous amount of their free time and, I suspect, a lot of money to provide a free service for you and I, so please do not abuse the system, otherwise the next time you call it up you may not get an answer. Always log on with your proper name and if you are asked for other details about yourself always tell the truth.

Before we can connect a home micro to one of these bulletin board services we need to have (1) a telephone modem, (2) a suitable RS232 interface, (3) software so that the micros can communicate with each other through the RS232 ports. I use a Telemod 3 modem together with the Xmodem software that is available free on most bulletin boards.

This program allows you to upload as well as download software from the bulletin boards. The upload part of the program is quite important, as all bulletin boards are essentially a two-way affair with you hopefully contributing your bit to the service. Most bulletin boards run at 300/300 baud full duplex although a growing number are using the Prestel baud rate of 1200/75. If you read last month's article on modems for the Commodore 64, you should have a fair idea on what modems to buy. However, if you are handy with a soldering iron you do not have to buy an expensive modem and interface. Maplins sell a modem and RS232 interface in kit form for about sixty pounds, and with a simple program (see listing 1) you are on your way.

Having purchased all the above, what do you get for the bother? As I mentioned earlier, exploring the various bulletin boards is like going on an adventure with every new board you discover offering something new. I will not go into detail as to what each bulletin board offers as this would spoil some of the fun, so I will confine myself to what they all provide.

Mailbox

Nearly all bulletin boards offer a type of mailbox service where you can send and receive messages from other users. Advice is something that is always freely available should you find yourself with a micro problem. Many boards allow users to place ads to sell their bits and pieces. There is

usually software to be downloaded free of charge so this is where the Xmodem program will come in handy; but please make it two-way, don't just download software, upload some of those useful programs and routines you have written as well, so that other people can benefit from them.

The one thing you will always find on any bulletin board service is a very friendly, helpful bunch of people. The system operators (sysops for short) are always willing to offer free advice to anyone.

Now you know something of what to expect, let's try one of the boards from List 2 taking note of the times they operate. First check that your computer, modem, disk drive and so on are connected properly and your modem is set on the correct baud rate (check the modem instruction book). Load the Communication program and run it. Next comes the exciting bit. Dial up your chosen number, if you are lucky, and the number is not engaged you should get a whistling sound. Switch your modem on-line and, if all is well, you should be greeted with the board's opening page and perhaps some news items about the system. You will eventually be asked to identify yourself. Answer the prompts with your proper name, as these will be logged so the system will know you next time and can be used for leaving messages for you. Having logged on you will be presented with a menu of what the system offers and how much time you will be allowed on the system.

Operation

There is usually a new user section, and you would be well advised to go through this section and make notes as you go. It would be a good idea to do this on each new board you find, as it could cut down your telephone bill by quite a bit. Please make sure before you telephone, that the board is in operation; all boards do not operate 24 hours a day. You may find that some bulletin boards operate a ring-back system. This means you telephone the board, let the telephone ring once and then ring off. You then telephone back again straight away, this time you should hear the whistling sound.

Bulletin board systems are not multi-user, (only one person can access it at the time) so you will have to be patient if the number is engaged. Don't give up as all bulletin boards are worth looking at and it is usually the most popular ones that are the hardest to get onto.

List 2 is not a full list of all the bulletin boards available as there are many thousands all over the world — it is just a list to get you started. It may be worth checking with your local council as many of them now run their own bulletin board service. If you really get the bug you may like to purchase one of the many books on bulletin boards around the world. If you want to try the USA, the Computer Telephone Book is worth looking at, especially if you do not have to pay for the telephone calls.

The world of micro communications is really worth looking into as it opens up all sorts of possibilities and after all, if the experts are to be believed, everyone will be using micros to communicate with each other before long. Have fun, but please do not abuse the systems and remember the bulletin boards are provided free for all to use.

If you would like a free listing of the Xmodem program for the Commodore 64. Send a large stamped self-addressed envelope (A4) plus 20p P.O. to cover cost of printing to:

B. Lloyd, 9 Hornbeam Walk, Witham, Essex CM8 2SZ. ■

Listing 1

```
0 REM COMMODORE 64 300/300 BAUD TERMINAL PROGRAM.
10 POKE 53280,08:POKE 53281,08:POKE646,1
11 WAIT 203,64
12 PRINT CHR$(147)
15 PRINT"          TELEPHONE COMPUTER"
17 PRINT"          ******************"
20 OPEN 10,2,0,CHR$(166)+CHR$(0)
25 IF PEEK(203) <> 64 THEN 100
30 GET#10,A$
35 IF A$="" THEN GOTO 25
40 IF ASC(A$) > 95 THEN GOTO 25
50 IF A$=CHR$(13) THEN PRINT A$;: GOTO 25
60 IF ASC(A$) < 32 THEN GOTO 25
70 PRINT A$;: GOTO 25
100 POKE 203,64:GET S$
110 IF S$=CHR$(17) THEN S$=CHR$(10)
120 IF S$=CHR$(19) THEN S$=CHR$(140)
130 PRINT #10,S$;:POKE 203,64:S$="":GOTO 30
```

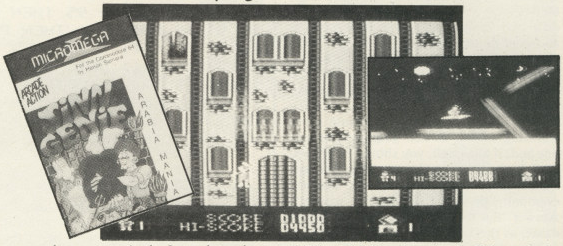
Sample bulletin boards

```
BLANFORD BOARD.....................0258 54494 (300/300 baud)
C.A.B.B.....................................01 631 3076 (300/300 and 1200/75
baud)
C.B.B.S.....................................0392 53116 (300/300 baud)
CHILTEN.(18.30-22.30).....................07073 28723 (300/300 baud)
CITY BULLETIN BOARD.....................01 606 4194 (300/300 and 1200/75
baud)
CUMBRIA (ring back 18.00-22.00).....069 92314 (300/300 and 1200/75
baud)
C-VIEW.....................................0702 546373 (1200/75 baud)
DISTEL (commercial).....................01 679 1888 (300/300 baud)
ESTELL (commercial 09.00-18.00).....0279 443511 (300 baud)
HULL-FORUM 80.....................0482 859169 (300/300 baud)
LIVERPOOL MAILBOX 80.....................051 428 8924 (300/300 baud)
LONDON TBBS.....................01 348 9400 (300/300 baud)
MAPTEL (maplin).....................0702 552941 (300/300 baud)
M.O.B.B.....................................0617 368449 (300/300 and 1200/75
baud)
N.B.B.S EAST.(22.00-19.00).....0692 630186 (300/300 baud)
```

PROFILE

Tales from the Arabian knights

***Graham Taylor** takes a magic carpet ride with Micromega's first CBM 64 programmer, Hanan Samara*



YOU'D BE forgiven for thinking that all computer programmers are males under 20 — it often seems like it. In fact, with the possible exception of adventure games, you might think that computing as a whole was one of the last bastions of male exclusivity.

Hanan Samara is one of the very few female home computer programmers, and her Micromega game **Jinn Genie** is one of the more interesting and entertaining Commodore programs released recently.

Hanan has a Masters Degree in maths, and first learnt a computer language, Fortran, as a necessary tool for completing her thesis. "I was working on a scheduling project and found I needed to use a computer" she explains.

Leaving university, Hanan worked with text editors for International Computer Systems and "picked up" Z80 machine code. As she explains it, it sounds easy — there's no hint of false modesty here; Hanan seems to regard it as no great feat.

Moving to Thorn-EMI, her Assembler experience earned her a job as program designer and project leader, chiefly on Atari programs.

But understanding assembly language and writing computer games are not automatically connected. Why games? I asked. Hanan referred to one of the programs which sparked her interest, with obvious enthusiasm. "I remember the first thing I ever saw; it was some sort of children's program involving Humpty Dumpty, and was almost like a little movie."

Dalali

Last January Hanan set up her own company, Dalali Software, with another ex-Thorn employee Adrian Wadley. Dalali will concentrate on producing games for other companies to market, and doing conversion and development work to contract. We talked about the thrill of programming in general, and the work on **Jinn Genie** in particular.

"The thing that excites me most is getting an idea and gradually turning it into reality through various stages."

'With **Jinn Genie** I was drawing on my own culture as an Arab. I was brought up with stories of Sinbad and genies, and it seemed a good idea to use them in a game. You start with the basic idea that you have an Ifreet (a Genie) which you must get into a bottle — that's your starting point, so then there's the question of where does the Genie start off, and where is the bottle."

"The final version of the game was quite different from some of my original ideas. I had originally thought it might be set at sea like many of the Sinbad stories." The game is set in the desert, and the process of getting the Ifreet into the bottle extends over four screens. In the first you battle demons on your magic carpet; on the second you search for the magic door; in the third you look for a basket, and release a prisoner, and finally you try to trap the Ifreet.

"From the main idea, it is a matter of fiddling with it and getting it all down in the form of a story board, just like those used for videos. Once it looked right on the story board the various sprites could be designed by drawing the shapes on squared paper. Actually once the storyboard and designs are right the coding is relatively quick, except when you have specific problems to overcome like making the scrolling smooth and so on."

Commercial

On the Commodore 64 as a programming machine, Hanan recognises that whatever the drawbacks, the market success of the 64 makes it and the Spectrum vital commercial targets. "Well, since I worked first with the Atari, I tend to favour it. For a machine that old it still has many more features that help the programmer. Nevertheless the 64 is close to the Atari in many ways; at least you get some sprites — with the Spectrum, for example, there's nothing there to work with — you even have to write your own scrolling routines."

Hanan went into more detail about the way she uses the 64 and the problems she faces as a programmer. "Well, eight sprites isn't many, although obviously you can use interrupts to give you multiples of that. The SID chip is intrinsically very powerful, but you have to work very hard to set it up — sometimes the restriction on the colours in multicolour mode is a problem.

"One thing I do like is the way you can get the hardware register to move the x,y position of the sprites — that's very useful. I guess my worst complaint is about the collision detection routines — all they really tell you is that something has hit something, while what you really need to know is exactly what sprite has hit what."

Returning to **Jinn Genie** as a game, I noticed that unlike almost everything else I had played recently, it was actually possible

to complete the game and get through all the screens at the easiest level after only a few plays. Was this intentional? "Oh yes, definitely. I always make sure a game is possible to do early on, but equally ensure that it gets gradually more and more difficult — to a certain extent this probably reflects US games thinking, which is where much of my work has been done in the past. I recognise that in this country you can get away with things getting tougher earlier — people have more patience here it seems."

Boardgames

The Commodore 64 will feature strongly in Hanan's future plans. Four programs are planned; one arcade game which she describes as a kind of race, a program designed for advertising purposes — a kind of shop-window display — and two "board" games. Hanan is reluctant to talk about future plans for reasons which are a mixture of business caution and, well, superstition; "I sometimes think that people's ideas float up into the air and into other people's heads."

I did persuade her to say a little more about the board games; "It's an idea we are talking about at the moment to do some computer versions of some board games that are not well known here, but have nevertheless been very successful — we want to do some things which are more complicated than what's been done previously on computers. I'd particularly like to do some things where it isn't all instant response, and you have to think."

With shades of that original Humpty Dumpty children's program in mind, Hanan is also interested in trying to do some educational software. "The problem is that most educational software is so bad. To do something good would need a lot of time and effort.

I asked if Dalali would ever market its own games instead of selling them to other people. "Obviously we would like to, but the financial risk and investment is simply too great at the moment." Nevertheless some of Hanan's experiences with other nameless companies have instilled a large degree of caution very quickly.

"I have had quite a few bad experiences; programs I've written have not been advertised properly, and generally the whole business of negotiating contracts is taking up more and more time — these days I won't do any programming at all until the contract is signed — it's just too risky."

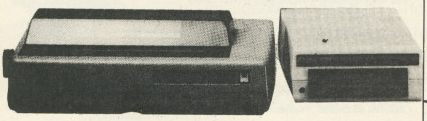
Hanan adds wearily; "When you start a software business, you gradually realise there is so much more to it than just programming." ■

3D COMPUTERS

THE HOME COMPUTER SPECIALISTS

Easy Parking at all branches

with more branches than any other Commodore specialist dealer we offer
ONE STOP SHOPPING
For your
64
call at your local branch for friendly advice and service.



See a complete display of hardware and software to build up your micro system.

SOFTWARE
All the best sellers from the top U.K. and U.S.A. software houses, eg.:
LLAMASOFT
DATASOFT
EPYX
INFOCOM
RABBIT
INTERCEPTOR
SUPERSOFT
ON-LINE
ABRASCO

PERIPHERALS
DISCS
PRINTERS
JOYSTICKS
MONITORS B&W/ COLOUR
LIGHTPENS
C2N CASSETTE DECKS

LARGE RANGE OF BOOKS, DISKETTES, CASSETTES & PRINTER PAPER ALWAYS IN STOCK

TOLWORTH
230 Tolworth Rise South,
Tolworth, Surbiton,
Surrey KT5 9NB
Tel: 01-337 4317

SUTTON
30 Station Road,
Belmont, Sutton,
Surrey SM2 6BS
Tel: 01-642 2534

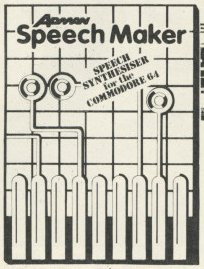
EALING
114 Gunnersbury Avenue,
Ealing, London W5 4HB
Tel: 01-992 5855

RICKMANSWORTH
Greystone Works,
The Green, Croxley Green,
Rickmansworth,
Herts. WD3 3AJ
Tel: (0923) 779250

NEWBURY
26 Stanley Road,
Newbury,
Berks, RG14 7PB
Tel: (0635) 30047

LUTON
1 Manor Road,
Caddington, Luton,
Beds. LU1 4EE
Tel: (0582) 458575

The Adman Speech Maker is a real conversation piece!

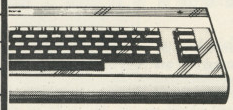


The Adman SPEECH MAKER makes writing programmes with speech really easy on the Commodore 64.

This latest synthesiser is pre-programmed not only with 234 set words and sounds, but also the 64 basic parts of english speech known as allophones, which can be used to build up your own limitless vocabulary.

The uses for this are endless—to give timed messages, for example, and to add an extra dimension to interactive educational programmes or adventure games.

It can also be used in conjunction with widely available programmes from some of the top software companies, such as the BJ and the Bear educational series (CBM), Twin Kingdom Valley (Bug Byte), Jack & the Beanstalk and 3-D Silicon Fish (Thor).



If you want a conversation piece for your Commodore 64, you'll find the Adman SPEECH MAKER at most good computer stockists.

Or simply order one direct from us at £29.95 with no extra charge for postage and packing!

Dept. C, Adman Electronics Ltd., Ripon Way, Harrogate, N. Yorks, HG1 2AU. Tel. (0621) 740972

Adman Electronics Ltd. is a member of the Adam Leisure Group PLC

Please send me an Adam 64 speech synthesiser at £29.95 ☐

Name .....

Address .....

.....

Cheques or PO's should be made payable to: Adman Electronics Ltd. Please allow 28 days for delivery.

ADMAN ELECTRONICS

PEAKSOFT

Tim Love's CRICKET

"BETTER THAN THE REAL THING!" — *Central TV*

BRITAIN'S NO. 1 CRICKET GAME!

Total joystick control over brilliant 3D graphics! CBM64 £8.95

Bowling:
Spin, pace, direction, length all under total joystick control!
Batting:
Batsman and bat under total joystick control!
Fielding:
Wicket-keeper and fielders under total joystick control!
Plus:
3 skill levels/scoreboards/bowling averages/batting and bowling practice.

The greatest cricket game *ever* for *any* home micro — anything else simply isn't cricket!!!

Rush me.....

For my CBM 64. I enclose a cheque/P.O. for:

.....

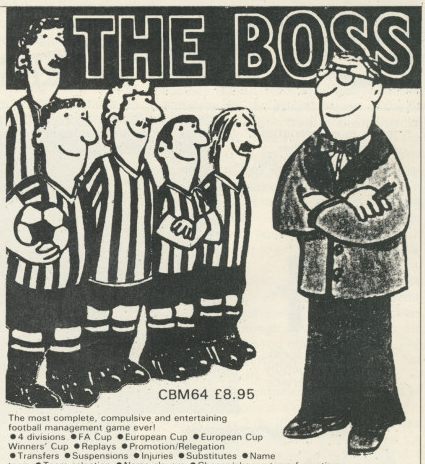
Name.....

Address.....

.....

.....

THE BOSS



CBM64 £8.95

The most complete, compulsive and entertaining football management game ever!
● 4 divisions ● FA Cup ● European Cup ● European Cup Winners' Cup ● Replays ● Promotion/Relegation ● Transfers ● Suspensions ● Injuries ● Substitutes ● Name team ● Team selection ● Name players ● Choose/change team formation ● Weekly league tables ● Fixtures/Results table ● Reserve squad ● Spy on other clubs ● Minute-by minute goal facts

VISA

PEAKSOFT

Check with your retailer. clip the coupon, or phone your Access/Visa number.
48 QUEEN STREET, BALDERTON, NEWARK, NOTTS.
Tel: 0636 705230 (24 hour answering)

REWRITE THE HIGH SCORE TABLES

So, you've got a Commodore. You've also got enemies. With the Gunshot, you'll have all the opposition cowering in corners. 8-directional action and an all-in-one moulded stem allows accurate annihilation and strength to survive those all-night sessions. Dual fire buttons for fading fingers (and a rapid fire version when they're really coming thick and fast). And, if you break it (and we know you'll try) our 12-month guarantee will prove invaluable. Only £8.95. The Gunshot plugs directly into the CBM 64 and Vic 20.

Ask about Vulcan interfaces for the C 16 and Plus 4.

See the range of Vulcan joysticks and interfaces at your local stockist ... we'll see you on the high score tables.

VULCAN ELECTRONICS LTD

Joystick Genius

200 BRENT STREET HENDON NW4 1BH TEL: 01-203 6366

MST MEANS BUSINESS

Special Autumn Offer of Commodore 64 Business Software compiled programs on tape and disk.
Buy any two tapes at £19.95 inc. each and get a **FREE MAILER**
Buy any two disks at £24.95 inc. each and get a **FREE MAILER**

MST BUSINESS ACCOUNTS PACKAGE
Tapes £19.95 inc., Disks £24.95 inc.
Super Accounting package for the small businessman. Cash flow analyser with Transaction List, Debtor/Creditor lists, Bank Account Report, Search/Amend records, Yr-to-date summary, Automatic Bring-forward, Alpha-numeric analysis code and related record range facility enables detailed analysis of each transaction. Screen/printer options. Suitable for V.A.T. or non-V.A.T. accounts. All transactions neatly linked with bank account to allow accurate up-to-date information on financial status.

RETAILER STOCK CONTROL SYSTEM
Tapes £19.95 inc., Disks £24.95 inc.
Will handle up to 450 stock lines per data file. Stock lists, re-order reports, evaluation reports and period sales report. Stock 'cards' allow for stock description, cost/sell price per unit, actual stock level, supplier code, and period sales.

MAILER/ADDRESS BOOK
Tapes £19.95 inc., Disks £24.95 inc.
Saves names, addresses, telephone numbers and searchkey characters on disk or cassette file. Find that unknown tel. number in a flash. Print out address book information, or labels, in a specified format, or view them on your TV screen. Searchkey characters enable selective searches to be carried out. Helper program on disk versions.

INVOICES/STATEMENTS FORMATTER (ADMINISTRATOR)
Tapes £19.95 inc., Disks £24.95 inc.
Format and print your own invoices, statements, and other documents — or use the ones provided. V.A.T., discount, totalling calculations done automatically. User-definable footer messages. Enter customer details once, and the program will generate required documents e.g. invoice, delivery note, advice note etc. Use plain paper, or pre-printed stationery.

DEALER ENQUIRIES WELCOME

Tick appropriate box. Prices include postage and V.A.T

	Tape	Disk
Business Accounts		
Stock Control		
Administrator		
Mailer		

Cheques etc. should be made payable to **MST CONSULTANTS.**

NAME .....

ADDRESS .....

.....

CARD NO ..... SIGNATURE .....

MST CONSULTANTS, NEWTON ROAD, BOVEY TRACEY, DEVON TQ13 9BB.
TEL: 0626-832617

ZOOM PASCAL. Powerful structured compiler, producing 6502 m/c. UCSD pascal commands, data types etc., and manmy additional commands, and an EDITOR. **£24.95/—**

ASSEMBLER 64. Professional development tool. Full assembler/disassembler allowing LABLES, VARIABLES PSEUDO OPS and CONTROL COMMANDS. **£11.99/7.99**

DATABASE 64. Menu driven database. Max 30000 records, 255 bytes/record, 15 fields/record. CREATE database, ADD, INSERT, DELETE, AMEND records. SEARCH for records on any field, including wild card matching (?,*). LOAD/SAVE databases to tape/disk. **£11.99/7.99**

ULTRABASIC 64. 50 extra commands-High res/multi colour (DOT, DRAW, BOX,CIRCLE FILL), Sprites (SPRITE, PLACE, ROTATE, OFF), Sound (SOUND, GEN, TUNE), Game (PADDLE, PEN, JOY), Turtle Graphics (TURTLE, MOVE, TCOLOUR, TURN, TURNTO), Timer/collisions (CLK, SCLK, SCOLL, BCOLL). Plus many more. **£19.95/14.95**

SYNTHY 64. Turns your 64 into a music & sound synthesiser, a piano, banjo, flute, drum and most other instruments. Also write your own music. **£12.50/9.95**

SUPER DISK UTILITY 64. Copy 1541 disk in 4 ways-TOTAL, FAM, FILE, APPEND. Display BAM, directorys. Edit/Change/Print and sector. Works with 1 drive. **£12.50/—**

CHARTPACK 64. Produces professional high res. pie/bar & line charts, & graphs. Data accepted in many formats. **£24.95/—**

GRAPHICS DESIGNER. Menu driven graphics editor. High/Low res. screens. Edit, load, save, print picture. Keyboard, joystick, light pen. Features include line box, circle, oval, triangle, fill, text, caption. **£19.95/—**

CHECK BOOK MANAGER. Computerised cheque balancing. Performs many functions. Store, Edit, Amend, Delete records. Much more. **£12.50/—**

ANATOMY OF THE 1541 DISK DRIVE. 300+ page book. Technical guide of 1541. ROM disassembly with comments, disk commands, data storage, DOS operation, relative records, direct access, disk structure, programs & lots more. **£14.95**

OXFORD PASCAL (£57), SUPERBASE 64 (£79), S.A.M (£43), MULTIPLAN (£81), KOALA PAD (£65), PRACTIFILE (£40), FRENCH (£13), GERMAN (£13), ITALIAN (£13), SPANISH (£13), CALC RESULT (ADVANCED) (£90), WORDWRITER (£37)
Above prices are disk.

SAE for full catalogue (over 100 programs, including DATABASES, WORD PROCESSORS, SPREADSHEETS, COMPILERS, EDUCATION, ACCOUNTING, UTILITIES, BOOKS, RECRATIONAL and much more).

All prices are DISK/TAPE '—' means unavailable on tape.

All programs come with a comprehensive manual.

DYNAMITE SOFTWARE

DEPT CM, BCM 8713, LONDON WC1N 3XX

WARP*5

GET A LOAD OF THIS!!!

£9.95 *inc. P/P*

WARP*5 will speed loading from your 1541 by over 5 TIMES FASTER.
Example: A 154 BLOCK program which normally loads in 1.40 will load with WARP*5 in 18 SECONDS!!
WARP*5 also includes enhanced DOS commands for easier use.
Also includes a bonus program — BOOT MAKER Convert your machine code programs to AUTO—RUN—WARP—LOAD from disk.

TOOLKIT MK.2

NOW THIS BEST SELLING COLLECTION OF 1541 DISK UTILITIES IS EVEN BETTER!!

Includes:
- FAST DISK COPIER
- EVEN FASTER DISK COPIER
- LOADING ADDRESS RELOCATOR
- AUTO RUN MAKER
- DOS CHANGER
- FILE LOCK/UNLOCK
- DISK DOCTOR
- DISK DRIVE MONITOR
- DISK LOG
- FILE RECOVERY
- COMPACTOR
- FILE COPIER
- DISK ERROR LOCATOR
- DISK ERROR MAKER — MAKES READ ERRORS 20,21,22,23,27 & 29 WHICH ALLOWS YOU TO BACKUP ALL YOUR VALUABLE PROTECTED DISK SOFTWARE.

Only £17.95 *inc. P/P*

Upgrade available for original TOOLKIT owners. Phone or write for details.

Overseas orders please add £1.00
Send cheque or P.O. to:

MPS SOFTWARE
36 Alexandra Grove, London N4 2LF
01-800 3592

ADVERTISEMENT INDEX

A
Audiogenic ..... Outside back cover
Associated Services Ltd 6
Adman 40
A & C 51, 53

B
Basic 53
Beyond 47

C
Calco 51
Chromasonic 48, 49
Compunet 4, 5
C.S.M. 12, 13

D
Digital Integration ..... Inside front cover

H
Holt Saunders 55

L
Llamasoft ..... Inside back cover

M
Mirage 24

N
New Generation 14, 15
Newtrends 46, 53

P
Peaksoft 40

S
Six Four Supplies Co 10
Six Four Software 19
Supersoft 57

T
Twilight 53

V
Voltmace 33

COMMODORE SOFTWARE FILE

Flight Master

Our first readers program for the C16 comes from David Hiscoke of London

FLIGHT MASTER isn't so much a flight simulator, it's more an interactive movie animation.

After the title screen you see the runway displayed, and you take off by pressing the up cursor key. If you release it too soon or press the wrong key you will crash.

Once in the air, you must keep the horizon level and in the middle of the screen by using the four cursor keys. If you can keep level for long enough you will see the landing runway, and you must then land using the down cursor key.

The program demonstrates the C16's superior sound and hi-res graphics commands.

```
10 REM    ** FLIGHT MASTER **
20 REM    ** DAVID HISCOKE **
30 TL=152:TR=154:L=7:R=313:W=5:L$="2":G=1:A=152:T=A:EH=150:RH=155:FL=0
40 COLOR 1,2:COLOR 0,1:COLOR 4,1:VOL8
50 GRAPHIC 2,1
60 BOX 1,0,155,316,0,0
70 ON VAL (L$) GOTO 120,200
80 DRAW 1,2,T TO 315,A,10,0:SOUND 3,T*5,7
90 GET A$:IF A$<>""THEN 330
100 H=(1+20*RND(1)):IF H<2 OR H>19 THEN 420
110 FL=FL+1:IF FL=50 THEN 500:ELSE80
120 GET B$:IF B$<>"□"THEN 460
130 DRAW 1,L,150 TO TL,W,0,0:DRAW 1,R,150 TO TR,W,0,0:DRAW 1,TL,W TO TR,W,0,0
140 IF B$="□"THEN 170
150 SOUND 3,W*6.5,5
160 IF W>150 THEN 80:ELSE120
170 DRAW 0,L,150 TO TL,W,0,0:DRAW 0,R,150 TO TR,W,0,0:DRAW 0,TL,W TO TR,W,0,0
180 W=W+4:TL=TL-2:TR=TR+2
190 SOUND 3,W*6.5,4:SOUND 2,W*6.5,2:GOTO160
200 CHAR 1,12,4,"FLIGHT-MASTER"
210 SOUND 1,10,230
220 FOR VV=1 TO 2000:NEXT VV
230 CHAR 1,10,8,"BY DAVID HISCOKE"
240 FOR VV=1 TO 1000:NEXT VV
250 GRAPHIC 0
260 CHAR 1,6,4,"■PRESS AND HOLD THE ↑ KEY■":CHAR 1,12,8,"■TO CONTINUE■"
270 FOR VV=1 TO 10000
280 SOUND 3,1020,5:SOUND 1,90,5
290 GET T$:IF T$="□"THEN 320
300 FOR ZZ=1 TO 100:NEXT ZZ
310 NEXT VV
320 L$="1":GOTO 50
330 DRAW 0,2,T TO 315,A,10,0
340 SOUND 3,T*5,8
350 IF A$="■"THEN T=T-10:A=A+10
360 IF A$="■"THEN T=T+10:A=A-10
370 IF A$="■"THEN T=T+10:A=A+10
380 IF A$="□"THEN T=T-10:A=A-10
390 IF A>140 THEN A=A-10:SOUND 1,750,4
400 IF T>140 THEN T=T-10:SOUND 1,750,4
410 IF A<11 OR T<11 THEN 460:ELSE 80
420 DRAW 0,2,T TO 315,A,10,0
430 IF H<2 THEN T=T-10:A=A+10
440 IF H>19 THEN T=T+10:A=A-10:SOUND 3,100,7
450 GOTO 390
460 FOR K=1020 TO 400 STEP-10
470 GRAPHIC 0,0:COLOR 0,3:SOUND 3,K,5
480 GRAPHIC 0,1:COLOR 0,1
490 NEXT K:STOP
500 WW=T+4:DRAW 0,2,T TO 315,A,10,0
510 A=T
```

```
520 DRAW 1,2,T TO 315,A,10,0
530 GET Y$
540 DRAW 1,EH,WW TO 151,T+1,10,0:DRAW 1,RH,WW TO 151,T+1,10,0:DRAW 1,EH,WW TO RH
,WW,10,0
550 IF WW>150 AND T>135 THEN 630
560 SOUND 2,WW*6,5
570 FOR F1=1 TO 100:NEXT F1
580 DRAW 0,EH,WW TO 151,T+1,10,0:DRAW 0,RH,WW TO 151,T+1,10,0:DRAW 0,EH,WW TO RH
,WW,10,0
590 SOUND 2,WW*6,5:IF Y$="■"THEN 610
600 WW=WW+1:EH=EH-1:RH=RH+1:IF WW>154 THEN 460:ELSE 530
610 DRAW 0,2,T TO 315,A,10,0:T=T+2
620 IF T>WW-2 THEN 460:ELSE 510
630 CHAR 1,13,7,"PLANE LANDED":SOUND 1,500,35:SOUND 1,600,35:SOUND 1,550,55
640 SOUND 1,400,20:SOUND 1,500,110
```

Mirror Image

This Vic game comes from Steve Johnson of Grantham

MIRROR IMAGE is a surrealistic space war game in which your fighter has to keep the space lanes open against the attacks of alien ships. The power of the protective shield decreases by five units each time an alien crashes into it, while your score increases each time you hit an alien, according to the height it was at. When your shield power drops to zero you are doomed!

Use Z and X to move left and right, and F5 and F7 to fire up and down.

```
10 GOTO500
20 GOSUB60:GOSUB350:GOSUB100
30 IFFG=1THEN600
40 GOTO20
50 END
60 P=PEEK(197):IFP=64THENRETURN
70 DX=(P=33)-(P=26):IF(X+DX)<7922OR(X+DX)>7943THENRETURN
80 POKEX,32:POKEX+DX,0:X=X+DX
90 RETURN
100 IFTH=1ANDBH=1THENBT=0
110 IFBT=1THEN140
120 YT=INT(RND(1)*7)+3:DT=INT(RND(1)*15)+7:T=7943-22*YT:ZT=1:TH=0
130 YB=INT(RND(1)*7)+3:DB=INT(RND(1)*15)+7:B=7922+22*YB:ZB=1:BT=1:BH=0:BC=0:TC=0
140 IFTH=1THEN170
150 POKES5,INT(RND(1)*40)+180:POKET,1:POKET+ZT,32:IFTC=DTTHENZT=-23
160 T=T-ZT:TC=TC+1:IFPEEK(T-ZT)=8THENGP=-1:POKET,1:POKET+ZT,32:GOSUB230
170 GOSUB190
180 RETURN
190 IFBH=1THEN220
200 POKES6,INT(RND(1)*40)+170:POKEB,1:POKEB-ZB,32:IFBC=DBTHENZB=-23
210 B=B+ZB:BC=BC+1:IFPEEK(B+ZB)=8THENGP=1:POKEB,1:POKE(B-ZB),32:GOSUB230
220 RETURN
230 POKES5,0:POKES6,0:GR=3:IFGP=1THENPG=B:GOTO250
240 PG=T
250 CP=PEEK(PG+GP+C):FORI=15TO3STEP-3:POKEPG+GP,GR:POKEPG-GP,GR:POKEPG+GP*22,GR
260 POKEPG+GP+C,2:POKEPG-GP+C,2:POKEPG+GP*22+C,2
270 POKEV,I:POKES4,240-I*6:POKES7,200-I*4:GR=GR+1:IFGR=7THENGR=32
280 FORK=7232TO7239STEP2:POKEK,INT(RND(1)*255)+1:NEXT
290 NEXT:POKEPG,32:POKES4,0:POKES7,0:POKEV,15
300 POKEPG+GP+C,CP:POKEPG-GP+C,CP:POKEPG+GP*22+C,CP:PO=PO-5:PRINT"■";TAB(18)PO"■■
 ":IFPO<5THENFG=1
310 IFPG=TTHENTH=1:GOTO330
320 BH=1
330 FORK=7232TO7239:POKEK,PEEK(K+8):NEXT:GOSUB590
340 RETURN
350 P=PEEK(197):IFP<>55ANDP<>63THENRETURN
360 DF=22*((P=55)-(P=63)):F=X+DF*2:IFPEEK(F)<>32THENGOSUB430
370 FS=FS+5:IFFS>180ORPEEK(F+DF)<>32THEN390
380 POKEF,2:POKES6,FS:POKES7,FS+10:F=F+DF:GOTO370
390 IFPEEK(F+DF)<>32ANDFS<185THENGOSUB430
400 POKES6,0:POKES7,0:F=X+DF*2
410 IFPEEK(F)=2THENPOKEF,32:F=F+DF:GOTO410
420 FS=140:RETURN
430 POKES5,0:POKES6,0:CP=PEEK(F+DF+C):POKEF+DF+C,2
440 FORI=0TO9:POKES4,INT(RND(1)*50)+130:POKES7,INT(RND(1)*50)+200
450 POKEF+DF,INT(RND(1)*5)+3:NEXT
460 POKEF+DF,32:POKEF+DF+C,CP:POKES4,0:SC=SC+INT(FS/4):PRINT"■■■■■■■"SC
470 IFF<7933THENTH=1:GOTO490
480 BH=1
490 RETURN
500 PRINT"□":PRINTTAB(10)"■■■F5":PRINTTAB(7)"■■FIRE UP":PRINT"■■■■Z■-LEFT"  +
 RIGHT-■X"
510 PRINTTAB(6)"■■■■FIRE DOWN":PRINTTAB(10)"■■F7"
```

```
520 PRINT"■■■■■ HIT ANY KEY TO PLAY":POKE198,0:WAIT198,1:POKE198,0:PRINT"■":POKE
36879,242
530 FORI=7168TO7679:POKEI,PEEK(I+25600):NEXT:POKE52,28:POKE56,28:CLR:POKE36869,2
55
540 FORI=7168TO7263:READA:POKEI,A:NEXT
550 C=30720:X=7933:DT=-1:DB=1:FG=0:PO=100
560 V=36878:S4=V-4:S5=V-3:S6=V-2:S7=V-1:FS=140:SC=0:POKEV,15:PRINT"■":GOSUB590
570 FORI=38400TO38619:POKEI,5:NEXT:FORI=38686TO38905:POKEI,3:NEXT:FORI=38642TO38
664:POKEI,4:NEXT
580 POKEX,0:PRINT"■■SCORE "SC;SPC(3)"POWER"PO:GOTO20
590 PRINT"■■■■■■■■■■■HHHHHHHHHHHHHHHHHHHHHHHH■HHHHHHHHHHHHHHHHHHHHHH":RETURN
600 F=8163:POKES6,0:POKES7,0:POKES4,164:POKES5,144
610 POKEF,10:POKEF+1,11:POKEF+2,32:IFF=X+220THEN630
620 FORT=1TO500:NEXT:F=F-1:GOTO610
630 FORK=1TO10:POKEF-22,2:F=F-22:NEXT
640 FORK=1TO10:SC=SC-INT(FS/4):GOSUB430:NEXT:POKEX,32:POKES4,0:POKES5,0:POKES6,0
:POKES7,0
650 F=F+220:FORK=1TO10:POKEF-21,32:POKEF-22,32:F=F-22:NEXT:POKE198,0:IFSC>HSTHEN
HS=SC
660 PRINT"■■■■■■■■■■■■■■■■■■■■HIGH SCORE"HS:PRINT"■■■■ANOTHER GAME(Y/N)?"
670 P=PEEK(197):IFP=11THEN550
680 IFP<>11ANDP<>28THEN670
690 POKE36879,27:POKE36869,240:POKE198,0:PRINT"■":END
700 DATA0,18,58,255,255,58,18,0,129,66,90,60,60,90,66,129,4,12,6,12,6,12,6,4
710 DATA0,0,60,36,36,60,0,0,0,126,66,90,90,66,126,0,175,165,72,48,48,72,165,175
720 DATA36,153,165,66,66,165,153,36,16,195,66,0,0,66,195,8
730 DATA0,85,0,170,0,85,0,0
740 DATA0,85,0,170,0,85,0,0
750 DATA0,4,4,63,63,65,255,127,0,0,2,7,15,255,254,204
```

Send us your Commodore programs, enclosing a cassette — and a printout on plain white paper if possible. Each listing must be accompanied by a typewritten introduction describing the program and explaining how it is constructed. We pay £6.00 for each bug-free listing published. We cannot guarantee to return every program submitted, so please keep a copy. If you want us to return your listing you must include a stamped, addressed envelope. If you have any problems with the programs, please write to the appropriate author, Software File, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD

commodore HORIZONS

RESERVE A COPY NOW...

Commodore Horizons is the No. 1 magazine for owners of the Commodore 64, Vic 20, C16 and Plus/4. Each issue is packed with game reviews, programming articles, letters, competitions and a host of other features. If you like your Commodore micro, you will love Commodore Horizons.

ASK YOUR NEWSAGENT...

Your newsagent will be happy to reserve a copy of Commodore Horizons for you each month. Simply fill in the form below with your name and address and hand it to your local newsagent and you could win £1000.

YOUR RESERVATION ORDER...

Please reserve me a copy of Commodore Horizons.

To:_____(Newsagent)

Address:_____

_____

_____

_____

Signed:_____

Name:_____

Address:_____

_____

_____

Complete this form and give it to your newsagent to reserve a copy of Commodore Horizons for you.

Fill in the coupon and get a chance to win £1,000 (see overleaf)

DUCKWORTH HOME COMPUTING

WILL YOU STILL LOVE ME WHEN I'M 64
Peter Gerrard

Designed for anyone who wants to produce the best sound from the Commodore 64, this book explores fully the world of ring modulation and envelope generation, and the powerful filtering capabilities that make the creation of unique sounds so easy. Many sample programs are included, covering three-part harmony, a proper synthesiser, generating sound effects, adding new musical keywords, musical interrupts and background tunes. There are sections on the chip that makes it all possible, the 6581 Sound Interface Device, and details of how to program the 64 to sound like many different instruments. £6.95

Peter Gerrard is the author of *Using the 64*, and is a regular contributor to *Which Micro?*, *Commodore Horizons* and *Personal Computer News*.

IMPOSSIBLE ROUTINES FOR THE COMMODORE 64
Kevin Bergin

These routines will enable you to utilise the more hidden areas of your 64. The book contains most of the answers to the questions that give you sleepless nights, and also provides an insight into how to approach future problems. The topics covered include protecting a program on tape or disk, moving Basic, scrambling programs, disabling control keys, and how to make a program auto-run as soon as it's loaded. There is a collection of routines to speed up program execution using the internal routines on your 64, and many other hints and tips such as adding commands to Basic, downloading the Commodore character set to an Epson FX80, and producing screen dumps, etc. Each routine includes a documented listing, along with a general outline of the idea and a detailed look at how the program was constructed. £6.95

Kevin Bergin is co-author of *The Complete Commodore 64 Rom Disassembly* and a regular contributor to *Personal Computer News*, *Commodore Horizons* and *Personal Computer World*.

Write in for a descriptive catalogue (with details of cassettes).

Access VISA

DUCKWORTH
The Old Piano Factory, 43 Gloucester Crescent, London NW1 7DY
Tel: 01-485 3484

REEL TO REEL –

	Per (10)	Per (100)
C-10	4.50	43.00
C-15	4.75	45.00

DISKETTES – CASSETTES

	DISCS (inc P&P)	Per pk of 10) SS/SD	SS/DD	NT price DS/DD
	5¼" NEWTRENDS	13.50	16.00	18.00
NEW	DBL SIDED DISK FOR 1541	–	–	19.60
	BASF	–	16.50	19.60
	3M	–	16.50	20.00
	DYSAN	–	25.00	35.00

CASSETTES – NEWTRENDS – (in pkgs of 10)

	STANDARD Per (10)	Per (100)
C-10	2.90	25.00
C-15	3.00	26.00

NEWTRENDS TECHNOLOGY LTD.
35 NORTH AUDLEY ST.
LONDON W1Y 1WG.

I ENCLOSE CHEQUE/PO FOR £.....
PLEASE SEND ME.....
NAME.....
ADDRESS.....
.....
.....POSTAL CODE.....

ALL PRICES INCLUDE VAT. Please add 50p P&P for orders under £20 (Europe £1 each item, airmail at cost). Make cheques/POs/MOs payable to: NEWTRENDS TECHNOLOGY LTD.

CASSETTES: ALL MAJOR BRANDS AVAILABLE C-5 THRU C-90 DISKS; ASK FOR DETAILS.

Now you have reserved a copy of **Commodore Horizons** at your local newsagent — here's your chance to...

WIN £1,000

and **50 RUNNER UP PRIZES** of software and books from Sunshine

Fill in your answers in the spaces below:

1._____
2._____
3._____

Complete the tie-breaker in 15 words or less:
I read Commodore Horizons because:

_____
_____

This person has reserved a copy of Commodore Horizons.
Signed:_____(newsagent)
Name:_____
Address:_____
_____

commodore HORIZONS

Signed:_____
Name:_____
Address:_____
_____
_____

Send this form to:
Commodore Horizons.
12-13 Little Newport Street, London WC2H 7PP

Just fill in your answers to the questions on the coupon above, complete the tie-breaker and send it to Commodore Horizons signed by your newsagent.

Question 1: What do the initials CBM stand for? Question 2: Why is the Commodore 64 so named?
Question 3: Which Llama loving programmer wrote Sheep in Space?

Become a regular Commodore Horizons reader — you know it makes sense. The No. 1 magazine for the No. 1 range of micros — together we are an unbeatable combination.

BEYOND

CHALLENGING SOFTWARE

Please send me **SPY** vs **SPY**			
for my Commodore 64 (£9.95)	CASSETTE ☐	QTY	
Commodore 64 (£11.95)	DISK ☐	TOTAL	

I enclose Postal Order/Cheque payable to **Beyond**, or charge my credit card

ORDER HOTLINE
0858 34567
ENQUIRIES
01-837 2899

Card Number _____
Access Visa (delete as necessary)

Name _____

Address _____

Postcode _____

Signed _____

Please send me details of the **Beyond** Club ☐

Based on the SPY vs SPY characters created by Antonio Prohias and the property of E.C. Publications Inc and used by permission. Licensed from First Star Software Inc.

BEYOND Competition House, Farndon Road, Market Harborough, Leicestershire LE19 9NR.

CHROMASONIC COMPUTER CENTRES

48 Junction Road, Archway, London N19 5RD Tel: 01-263 9793 and 9495
238 Muswell Hill Broadway, Muswell Hill, London N10 Tel: 01-883 3705

WELCOME TO THE WORLD OF COMMODORE

Maintenance, Service, Support, Training
all from your No. 1 Commodore centre

Commodore 16

THE STARTER PACK
Commodore 16 computer
Cassette unit
Intro to basic part 1
Four games

£139.99

Commodore 64

PROFESIONAL SYSTEM
Commodore 64 computer
1541 disk drive
MPS801 dot matrix printer
FREE SOFTWARE
Easyscript (wordprocessor)
Easyfile (database)
Intro to basic part 1
FREE MEDIA
Box of 10 disks
Box of paper

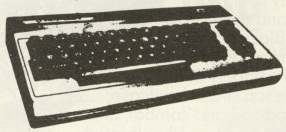
£599.00

Printer's

RX80T	£228.85
RX80FT	£274.85
RX100	£442.75
FX80	£378.85
FX100	£545.95
DX100	£488.75
LQ1500	£1092.50
Juki 6100	£396.75
Daisystep 2000	£328.90
Ibice LTR-1	£228.00
64-centronics cable	£19.95
Software for above (cass)	£7.95

Commodore 64

Commodore 64 computer	£195.95
SX64 portable computer	£795.00
1530/1 cassette unit	£39.10
Super Saver cassette unit	£29.95
1541/2 disk drive	£195.95
1520 printer/plotter	£99.99
MPS801 dot matrix printer	£195.95
MPS802 dot matrix printer	£295.95
MCS801 colour printer	£399.99
BPS1101 daisy wheel	£399.99
1701/2 colour monitor	£195.95
Z80 card	£50.00
Commodore joystick	£6.90
Quickshot II joystick	£10.50
Commodore paddles	£13.50
Microguide	£5.95
Plinth for 64 system	£24.95
Superbox 64 (inc IEEE)	£94.95
Vic switch	£97.75
DAM's IEEE interface	£69.95
Surge protector plug	£12.95
CBM64 to centronics int	£69.60



Commodore 64 guaranteed for 2 years

Plus 4

THE OFFICE AT HOME
Built-in software:
Wordprocessor
Database
Spreadsheet
Business graphics

£299.99

Commodore 64

STARTER PACK
Commodore 64 computer
Cassette unit
Intro to basic part 1
Quickshot II joystick
Game of our choice

£255.00

Monitor's

Commodore 1701	£195.95
Microvitec 1431AP	£246.70
Phillip's 12in green	£79.35
64-Phillips cable	£2.50
Monitor plinth	£11.50

Terms

All products guaranteed for 1 year unless otherwise stated. Payment may be made by Access, Barclaycard, Bankers draft, Building Society cheque, cash or Postal Order. Sorry cheques need 5 days for clearance. We reserve the right to change prices without prior notice. **All prices are inclusive of VAT.**
Please check before ordering for carriage charges.

64 Software

	cass	disk		cass	disk
Fighter Pilot	£9.95	£14.95	Ghostbusters	£10.99	
Summer Games	£14.95	£19.95	Raid Over Moscow	£9.95	
Macbeth	£14.95		Space Shuttle	£9.95	
Psi-Warrior	£9.95		Staff of Karnath	£9.95	
F-15 Strike Eagle	£9.95		Zaxxion	£9.95	
Blue Max	£9.95	£14.95	TLL	£7.95	
Scrabble	£12.95		White Lightning	£14.95	
Cluedo	£12.95		Bruce Lee	£9.95	£14.95
Combat Lynx	£8.95		Flight Simulator II		£42.95
			Tapper	£9.95	

cass=cassette disk=diskette
R=rom

Media Supplies

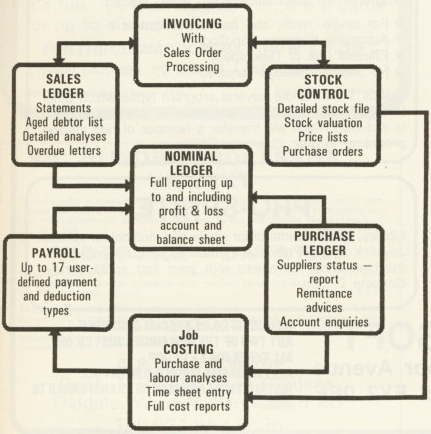
Diskettes
Disks by Verbatim
SS/DD 40Tr. £17.95 SS/DD 80Tr. £24.75
DS/DD 40Tr. £38.92 DS/DD 80Tr. £32.75
Lockable disk storage boxes 40/80 £16.50/£25.25
Disks are supplied in boxes of 10
Computer listing paper
11x8.5 £13.80 11x9.5 £12.65 11x15.5/16th £15.52
Paper is supplied in boxes of 2000 sheets
Printer ribbons
MPS801 £6.99 RX80/FX80 £5.00 Daisystep £5.50
MPS802 £7.99 1515/1525 £6.25 Juki £1.85

Maintenance, Service, Support, Training, Installation
all from Chromasonic Business Systems

The Pegasus System

STAND-ALONE OR FULLY INTEGRATED

Fast, precise accounting power . . .
. . . right at your fingertips



Phone us now to see how Pegasus accounts programs can help you and your business

Special Offer

For further details of a very special offer of
FREE SOFTWARE
WORDPROCESSOR DATABASE SPREADSHEET
with every purchase of a Commodore business system
PHONE US NOW

Commodore

8296D
128K Computer
integral disk drive
and monitor

Wordprocessor,
Database Spreadsheet
and
DOT MATRIX PRINTER

£1690.00 + VAT

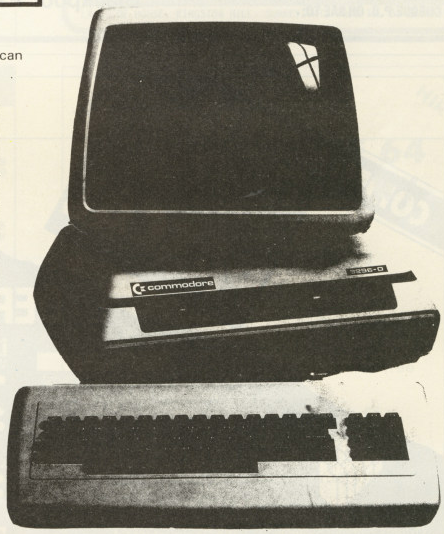
Commodore Business Equipment

8296 GD inc Hi-Res Graphics	£1845
8296 128K Computer	£715.00
SFD1001 Single disk drive	£445.00
8250 Dual disk drive	£805.00
4023 Dot matrix printer	£310.00
1361 Dot matrix printer	£560.00
Pet to IEEE cable	£27.00
IEEE to IEEE	£31.00

NB — All prices are exclusive of VAT

Superoffice

The Ultimate Commodore Office Administration System
The complete office automation system, with *Full Records Management, Calculation, Word Processing and Spell Checking*



CHROMASONIC PERSONAL COMPUTERS

48 Junction Road, Archway, London N19 5RD.
Tel: 01-263 9493 and 9495.
238 Muswell Hill Broadway, Muswell Hill, London N10
Tel: 01-883 3705

FAST LOADERS **COMMODORE 64** TAPE TO DISK

R.B.S.

A NEW GENERATION conversion utility, developed from the acclaimed Hypersave-64, R.B.S. converts virtually all your long loading cassette programs to TURBO-LOAD, faster than the CBM disk drive. Multi-part and autorun programs are handled with ease. Converted programs load independently. No additional hardware, no pokes, no SYS calls, no user knowledge required. Load "The Hobbit" in 120 seconds. Tornado, Lightning load, Fastback now obsolete. R.B.S. will convert more programs than any competing utility. Cassette £7.50p.

HYPERSAVE-64

Retaining the flexibility which the programmer demands. Hypersave leaves you in control. 8 additional Basic commands. Save, load, verify up to 48K continuous Ram at HYPERSPEED with full error checking. Converted programs reload independently. Autorun facility. Hypersave also allows a small number of fast loading programs to be converted to Hyperload. Reviewed in Your 64 issue 2. Cassette £7.50p.

DISKUS I

Introducing the new market leader. This is the simplest to use and most efficient tape to disk transfer utility yet devised. No program rewriting is required and transferred programs will automatically run when loaded.

- ★ For single, multi, and autorun programs
- ★ Automatic filename handling
- ★ Efficient use of Disk space
- ★ No user knowledge required

Diskus 1 will handle several program types which other utilities ignore, including headerless files. A bonus program is included which will transfer a number of fast loading programs to disk. Cassette £7.50p.

PRO-SPRITE

Library, Editor, Animator for single and multicolour sprites. Joystick control. Packed with features. Menu driven. 100% machine code. Complete with your first sprite library. Cassette £7.50p.

FREE WITH EVERY ORDER:
***SECRETS!* A GUIDE TO CASSETTE I/O CONTAINING PREVIOUSLY UNPUBLISHED SECRET INFORMATION. FAST DESPATCH GUARANTEED. CHEQUE/P.O. OR SAE TO:**

DOSOFT
2 Oakmoor Avenue
Blackpool FY2 0EE

DISKUS I IS £9.99 *SPECIAL DISCOUNT*: ANY TWO OF THE REMAINDER JUST £9.99P. ALL THREE ONLY £15.00P. ALL PROGRAMS SUPPLIED WITH FULL INSTRUCTIONS AND MAY BE TRANSFERRED TO DISK.

COMMODORE 64

OXFORD PASCAL

YOUR FUTURE WITH COMPUTERS DEPENDS ON PASCAL

BECAUSE
- PASCAL is the world's most popular programming language after BASIC
- PASCAL is FAST... up to 20 times the speed of BASIC

WHAT IS OXFORD PASCAL?
OXFORD PASCAL is a COMPLETE implementation of the popular programming language PASCAL running on the Commodore 64

GRAPHICS & SOUND
With the OXFORD extensions to PASCAL you can programme dazzling graphics and astounding sound

WHAT DO I GET?
With the cassette version of OXFORD PASCAL you get:
- A powerful text editor for preparing PASCAL programs
- A resident compiler giving 14k of user RAM
- A powerful set of colour graphics and sound extensions to standard PASCAL

With the disk version of OXFORD PASCAL you get:
- All the above, PLUS
- A full disk to disk compiler exploiting the entire memory of the 64 for PASCAL programs.

HOW MUCH DOES OXFORD PASCAL COST?
Cassette version (resident compiler only £19.95
Full disk compiler (1541, 4040, 8050, 8250 drives) £49.95
Prices are exclusive of VAT. There is also a small charge for post and packing.

Oxford Computer Systems (Software) Ltd
Hensington Road,
Woodstock,
Oxford OX7 1JR, England
Telephone (0993) 812700
Telex 83147 Ref. OCSL

See what happens
when you play.

LEWDO!

It's fun . . . It's naughty . . . It's a game for up to six adults.

FOR THE COMMODORE 64 — now £5.95

Twilight Software, PO Box 64, London, E11 4SH.

LEWDO! is unsuitable for under — 18s. Joysticks not needed

VIC 20 WORD PROCESSOR — VICTEXT

Powerful word processor. Facilities include:— Large text buffer, auto centre text, variable tab, insert, amend, delete, copy, move text, word count, right justify etc. Fully menu driven with comprehensive easy to use instructions. Great value.
VIC 20 + 16K ..... cassette £6.95
VIC 20 + 16K ..... disk £9.45

VIC 20 FILE — DATA FILE

Takes the place of any card index. Facilities include:— save, load, file, full sort, print all – part records, amend, delete records, memory remaining etc.
VIC 20 (+ 8K min.) ..... cassette £4.50

All programs with full documentation and guarantee and can be used with all direct connect VIC printers including 1520 printer – plotter and most Centronics (with suitable hardware interface) if required. Price includes VAT, packing and fast delivery by 1st class mail.
Cheques – PO's to:

A & C SOFTWARE
Dept. 1, 75 Oakthorp Gardens,
Tividale, West Midlands B69 2LF
Tel: 021 557 8596

SOPHISTICATED GAMES FOR VIC 20/CBM64

VIC/64 CRICKET Realistic game of tactical skill and luck. Ball by ball commentary with full scorecard and all the major rules of cricket correctly interpreted. Printer/game save facilities.
VIC CRICKET for VIC 20 + 16K 5.99
NEW: 64 CRICKET with extra features 6.99

LEAGUE SOCCER League title game for 2-24 players with automatic fixtures, action commentary, results check, scorers, league table, cup draw etc. Printer/game save facilities.
LEAGUE SOCCER for VIC 20 + 16K 5.99
NEW: 64 LEAGUE SOCCER with many more features still 6.99

WHODUNNIT 12 guests have gathered for drinks at Murder Manor, but one of them has more than drinks on his mind. Addictive and thrilling detective game for 1 to 6 players, with genuinely different game each time.
WHODUNNIT for VIC 20 + 8K or any CBM 64 (state which) 4.99

TOP OF THE POPS Easy to learn game about the music business. For up to 10 players. Includes printer/game save features.
TOP OF THE POPS for VIC 20 + 8K 4.99
NEW: 64 TOP OF THE POPS — even bigger and better 5.99

ELECTION NIGHT SPECIAL Lead your own party into the next General Election. A game for 1-3 players. Printer/game save.
ELECTION NIGHT SPECIAL for VIC 20 + 8K 4.99
64 ELECTION NIGHT SPECIAL — bigger and better ..... COMING SOON

PARTY 4 Four games to match the progress of your party: MASTERWORD, A DAY AT THE RACES, GAME X (Strip Poker) and CONSEQUENCES. Harmless fun (nothing offensive) but good fun.
VIC PARTY 4 for VIC 20 + 3K or more 5.99
64 PARTY 4 ..... COMING SOON

***NEW*: ADULTS ONLY** Fun game for 2-10 broadminded players. Lots of cuddling and kissing, plus many other rewards and forfeits: you never know what you'll end up doing, or with whom! Nothing offensive, but you MUST be fairly broadminded.
ADULTS ONLY for VIC 20 + 16K expansion 5.99
64 ADULTS ONLY ..... COMING SOON

DISC VERSIONS AVAILABLE FOR ALL GAMES — £2.00 EXTRA. ALL PRICES INCLUDE (P&P) (UK ONLY). GAMES SOLD SUBJECT TO CONDITIONS OF SALE WHICH ARE AVAILABLE ON REQUEST. PLEASE WRITE OR PHONE FOR DETAILS OF OUR FULL RANGE

SOPHISTICATED GAMES
Dept CH, 27 Queens Rd, KEYNSHAM, Avon BS18 2NQ
Tel: 02756-3427

Superbase 64

TRANSFORMS THE COMMODORE 64 INTO A FULL FEATURED PROFESSIONAL DATABASE SYSTEM, WITH UP TO 1000 CHARACTERS PER RECORD ON UP TO 4 SCREENS... AND UP TO 128 ITEMS PER RECORD, DEFINABLE AS KEY, TEXT, NUMERIC, CONSTANT, RESULT OR DATE, IN FILES OF UP TO 16M CHARACTERS! SUPERBASE 64 EVEN HAS A SPREADSHEET AND CALCULATOR CAPABILITY, CALENDAR FUNCTIONS, EASY INPUT FROM WORDPROCESSOR OR DATA FILES, BOTH MENU-DRIVEN AND PROGRAM OPTIONS, SORTING/SEARCHING, FULLY DEFINABLE OUTPUTS... SUPERBASE 64 IS ESSENTIAL IF YOU WANT THE MOST FROM YOUR 64! SUPPLIED ON 1541 DISK WITH EXCELLENT TUTORIAL/REFERENCE MANUAL PLUS AUDIO LEARNING TAPE...

OUR PRICE ~~£99.95~~ £88.00

Jetpack

YOUR PROGRAMS WILL REALLY TAKE OFF WITH DTL JETPACK 64! 100% COMPATIBLE WITH CBM BASIC, JETPACK COMPILES BASIC PROGRAMS INTO MACHINE CODE, RUNNING UP TO 25 TIMES FASTER... AND USING UP TO HALF AS MUCH MEMORY, TO GIVE FASTER LOADING, OR BIGGER PROGRAMS! AND IT EVEN ACCEPTS BASIC EXTENSIONS AND MACHINE CODE ROUTINES AS WELL!

OUR PRICE (DISK) ~~£39.95~~ £35.95

Master 64

HAS EVERYTHING YOU NEED FOR PROGRAMMING TO TOP PROFESSIONAL STANDARDS! BASIC IV, MACHINE CODE MONITOR, AND 85 POWERFUL NEW COMMANDS... INCLUDING TOOLKIT, BUSINESS BASIC, KEYED ACCESS FILES, DISK DATA COMPRESSION, FORMATTABLE SCREEN ZONES, MULTIPLE SCREENS, DATE CONTROL, REPORT GENERATOR, 22-PLACE ARITHMETIC, SCREEN PLOT, SCREEN DUMP, AND MORE...

ALL FOR ONLY £64.95!

VIZAWRITE 64

VIZAWRITE 64 IS A HIGH-PERFORMANCE, LOW-COST WORD PROCESSOR WITH ON-SCREEN FORMATTING, THAT TAKES FULL ADVANTAGE OF THE 64'S COLOUR, GRAPHICS AND MEMORY FEATURES... AND SUPPORTS VIRTUALLY ANY PRINTER! WITH A COMPREHENSIVE AND EASY-TO-FOLLOW USER REFERENCE MANUAL, VIZAWRITE IS THE ULTIMATE PERSONAL COMPUTER WORD PROCESSOR! AVAILABLE ON CARTRIDGE (~~£89.95~~ £78), DISK (~~£79.95~~ £68) OR WITH VIZASPELL (~~£99.95~~ £85)

*** WANT IT TOMORROW? *** CALL US TODAY! *** ON 01-546-7256

VIZASTAR	(DISK)	~~£99.95~~ £89.00	MULTIPLAN (US)	(DISK)	~~£79.95~~ £67.95
VIZASPELL	(DISK)	~~£59.95~~ £49.95	PRACTICALC	(DISK)	~~£44.50~~ £39.95
EASYSCRIPT	(DISK)	~~£75.00~~ £65.00	PRACTICALC	(TAPE)	~~£39.95~~ £34.95
EASYSPELL	(DISK)	~~£50.00~~ £41.95	HOMEBASE 1-4	(SUPERBASE)	£17.95
SIMON'S BASIC	(CART)	~~£50.00~~ £41.95	STEPPING STONES	(SUPERBASE)	£9.95
FIGARO 64	(DISK)	~~£86.25~~ £75.00	PRINTLINK 64	(INTERFACE)	£29.95

PRICES INCLUDE 15% VAT AND ARE CORRECT ON GOING TO PRESS. ORDER BY POST OR PHONE, USING CHEQUE, ACCESS/BARCLAY CARD OR OFFICIAL ORDER. DESPATCH IS BY SAME-DAY 1ST CLASS POST, PRE-PAID ORDERS FREE. PRODUCT DATA AVAILABLE ON REQUEST. REF A31

VISA

Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 01-546-7256

HIRE HIRE

COMMODORE 64 GAMES LIBRARY

- 700 Plus titles
- Return of post service guaranteed
- Full 7/14 day hire
- Up to 4 games at once

SPECIAL XMAS OFFER

Usual joining fee = £6
+ first 2 games free

Xmas offer fee = £5
+ first 3 games free

if you join before 28 February 1985

- Only originals used
- Each member gets a full joining kit

COMMODORE 64 GAMES LIBRARY
c/o THE YORKSHIRE SOFTWARE LIBRARY
UNIT M11, STANNINGLEY INDUSTRIAL CENTRE
PUDSEY, WEST YORKSHIRE.

CLASSIFIED

SOFTWARE

COMMODORE 64 DATABASE — DATAFILE

Powerful options include: print all/selectve records, delete, amend, save, load, copy, alphanumeric sort, user defined fields, memory check, total numeric fields, multi field interrelational, global and between limits searches, etc. Fully menu driven with comprehensive easy to use instructions.

CBM 64 (compiled) cassette £7.45
CBM 64 (compiled) disk £10.45

COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor, facilities include — large text buffer, auto centre, variable tab, insert, amend, delete, copy, move text word count, right justify, paging, join files, multiple file handling, print all/part text etc. Fully menu driven with comprehensive easy to use instructions. Great value.

CBM 64 (compiled) cassette £8.25
CBM 64 (compiled) disk £10.75

All programs with full documentation and guarantee and can be used with all direct connect CBM64 printers including 1520 printer/plotter. Also most centronics (with suitable hardware interface). Price includes fast delivery by first class post. Cheques/PO's to: A & C SOFTWARE

Dept. 1, 75 Oakthorp Gardens, Tividale, West Midlands B69 2LF

Tel: 021 557 8596

CBM64 Easyscript and Future Finance for sale. Unused, good offers. Please phone 021-308 5123 weekends, Mr Latham.

COMPUTER Battleships, Invader 1000, Blip Electronic Tennis game, CB 2 channel walkie talkies. Swap any of above for Commodore 64 software, any considered. Details ring Skipton 0756 69307 anytime.

FOR SALE

CBM 64 user port extension — extend your 64 in to the real world with our new unit. Features up to 4 separate switched outputs (four digital bit IPS) complete with introduction applications cassette. Great value, only £28.95 inc. SAE for details or orders to B and M Electronics, 152 Hirstgate, Mexborough, S. Yorkshire S64 0DP.

DR WATSON assembler course with cassette for Vic 20, £7.50 inc post. Tel: Heywood 624873. 55 Shaftsbury Drive, Heywood, Lancs OL10 2PH.

COMMODORE 64 software for sale. All oroginal and in very good condition, from £1 each — all half price and less. S.A.E. for list to Butcher, 9 Hornbeams, South Benfleet, Essex.

COMMODORE 64 for sale many US and British titles including Pole Position, Int. Soccer and Flyer Fox. Will also swap. Tel: Brian after 6pm on (041) 810 3750.

CHEAP and unique for the CBM64! Surround and Mazerace — 2 player games of fast competition. Spritist — Sprite Editor of top class quality. Synsisor — real music synthésisor. Only £5 each. From J. Gildie, 48 Rotchell Park, Dumfries, Scotland DG2 7RJ.

FOR SALE Halls of Death, Forest Land and Xerons. All originals, £6 each or £15 for the lot. All on cassette for CBM 64 will swap. Contact: Asif (061) 881 1360. Also Kong — £7 separate.

ANYONE interested in helping me obtain The Game of Life for the CBM 64, listing or tape, all letters answered. Robert Graham, Fairfield, West Hill, Wadebridge, Cornwall.

WOW!!!! bargains extraordinaire for le Vic 20 and C64. For Vic:— Xeno II £3.50, Bongo £3.50, Arcadia £2.50, Wacky Waiters £3, 3D-Tjme Trek £3: For 64:— Introduction to basic part one only £8 (R.R.P. £14.95). Mike, 0558 822509.

YOO-HOO!! amazing bargains! All originals. Vic 20 programs:— Imagine's Arcadia £2.50, Wacky Waiters £3; Anirog's Xeno II £3.50, Bongo £3.50 (both 16K); Wizard and the Princess £2.50 and finally Anirog's 3D-Time Trek (fantastic value) £3. Mike, 0558 822509.

WANTED

WANTED PROGRAMS on disk (CBM 64/1541) send disk and list of programs held/wanted. I have over 600 games and utilities to trade. Lets hear from you oversaes 64 owners. All mail please to Taff Hutchings P.O. Box 48, Derby DE6 6QP England. All letters answered, disks returned by first class mail.

WANTED: FOOTBALL MANAGER, Caverns of Khafka, Decathlon, Death Star, B.C.'s Quest for Tires, Potty Pigeon, Space Pilot, Sencinel, Pooyan, F.P.2, Voodoo Castle, Wimbledon, for CBM 64. Paul Flanagan, Corry, Belleek, Co. Fermanagh, Northern Ireland or phone: 03656 5594.

I WOULD LIKE to hear from other Belgian or U.K. CBM 64 and C2N users to swap programs and knowledge. Please contact (send software list to) Fernand Izebout, Fontaine Au Chêne 14, 1320 Genval (Belgium).

DISC DRIVE WANTED for Commodore 64, £100. Also printer, £100. Henry Browes, 11 Veronica Close, Basingstoke, Hants. 0256 58922 evenings.

WANTED CBM 64 with add-ons swap for Yashica Super 8 movie camera, projector, editor, screen, splicer, filming lamp, all immaculate. First viewer will want. Phone weekends 0329 235331. Write 27 Wakefield Avenue, Fareham, Hampshire PO16 7RJ.

WANTED ASSEMBLER EXPERT CBM 64. I'm a freelance programmer with original ideas and graphics skills. I'm slow at assembler. Be my partner, increase my output, make a living. Someone living in London preferred. Phone 01-987 5476.

CBM 64 USER in Denmark wants to exchange games and utility programs. (More than 800 titles.) Send list to: Jan Eriksen, Benterejy 3660, Stenlose, Denmark.

WANTED VIC 20 RAMPACKS, mother boards, 40/80 column programs or boards, terminal emulator software. Condition of hardware not important (preferably working), send details to Dave Walker, 71 St. Ronans Road, Southsea, Hampshire PO4 0PP.

WANTED FOR CBM 64 disc drive, printer, Simon Basic, easy file, easy script, and disc utilities. Offers for all or part to, Tel: 0624 823653 or write to Ken Page, 'The Cornie', Bayr Grianagh, Castletown, I.O.M.

Here's my FREE Classified Ad.

(PRIVATE ADVERTISERS ONLY)

PLEASE WRITE YOUR COPY IN CAPITAL LETTERS ON THE LINES BELOW

NAME.....

ADDRESS .....

.....

.....

TELEPHONE .....

Please cut out and send this form to:

CLASSIFIED DEPARTMENT
COMMODORE HORIZONS
12-13 LITTLE NEWPORT STREET,
LONDON WC2R 3LD

VIC 20 OWNERS!

The Ultimate Reference Book

The definitive work on the VIC-20 computer. Its compiete coverage is essential for the level of computer literacy sought today.

The only comprehensive teaching and reference book on VIC-20 and its peripherals. Topics include this and more: BASIC syntax, storage, functioning, efficiency; designing, debugging BASIC; algorithms; techniques, keyboard; program recovery; utilities and tricks; security. Machine language: introduction and full course; every opcode explained; fast graphics &c routines; interrupts; using inbuilt ROM routines; guide to ROMs; memory maps; mixing ML with BASIC; all aspects of graphics and sound; tape, disk detailed, with full commands, file-handling, ML programs, &c; games port, printers and other peripherals; hardware outline; VIC; VIAs; tips; interfaces; appendices.

Programming The VIC. Many programs, charts, and diagrams. 17 chapters. Appendices. 608 pages. 7½" × 9" paperback. Published by Level Ltd (Computer Publications) in UK, Compute! in USA. UK ISBN 0 9507650 1 5. Price in UK and Europe £15.90 each (includes post and packing). From dealers and bookstores or direct (48-hour order turnround; ordering information below). Also available: **Programming The PET/CBM** (ISBN 0 9507650 0 7) at £14.90. Available March 1985: **Programming The Commodore 64.** Queries: Tel. Level Ltd (01) 794 7241.

Send orders and make cheques payable to:
Biblios Ltd, Star Road, Partridge Green, HORSHAM, W. Sussex RH13 8LD. Tel: 0403-710971.

Send .....copy/ies Programming The VIC at £15.90

I enclose cheque/PO for £ .....

NAME.....

ADDRESS.....

CH0285

NEW!

THE EASY WAY TO KEEP YOUR RECIPES.

Searching through hundreds of recipes taken from magazines for exactly the kind you want to see can be almost impossible, but its easy with your Commodore 64.

RECIPE SEARCH (£10*) is ready to use.

You build up your record as you get new recipes and typing is kept to a minimum.

TWILIGHT SOFTWARE, PO BOX 64, LONDON E11 4SH.

*Cassettes—includes p and p. £1 extra overseas. Or send for details.

COMMODORE 64 DATABASE — DATAFILE

Powerful options include: print all/selectve records, delete, amend, save, load, copy, alphanumeric sort, user defined fields, memory check; total numeric fields, multi field interrelational, global and between limits searches, etc. Fully menu driven with comprehensive easy to use instructions.

CBM 64 (compiled) cassette £7.45
CBM 64 (compiled) disk £10.45

COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor, facilities include — large text buffer, auto centre, variable tab, insert, amend, delete, copy, move text word count, right justify, paging, join files, multiple file handling, print all/part text etc. Fully menu driven with comprehensive easy to use instructions. Great value.

CBM 64 (compiled) cassette £8.25
CBM 64 (compiled) disk £10.75

All programs with full documentation and guarantee and can be used with all direct connect CBM64 printers including 1520 printer/plotter. Also most centronics (with suitable hardware interface). Price includes fast delivery by first class post. Cheques/PO's to: **A & C SOFTWARE**

Dept. 1, 75 Oakthorp Gardens, Tividale, West Midlands B69 2LF
Tel: 021 557 8596

NEWTRENDS TECHNOLOGY

PLUS H BUSINESS PACK

INC. CBM +4, 1541 DISK DRIVE & IMPEX COMPANY PAC 1*2*3 AS DEMONSTRATED AT WHICH COMPUTER SHOW JAN 85 AT COMMODORE STAND

£575.00 INC. VAT

OTHER HARDWARE	INC. VAT
CBM 64 COMPUTER	188.00
1541 DISK DRIVE	195.00
PLUS 4 COMPUTER	288.00
1530 CASSETTE UNIT	39.00
1531 CASSETTE UNIT	40.50
1701 COLOUR MONITOR	195.00
MPS 801 PRINTER (50cps)	195.00
MPS 802 PRINTER (80cps)	295.00
1520 PRINTER/PLOTTER	99.00
BPS 1101 PRINTER (DAISYWHEEL)	399.95

*Send for free catalogue

NEWTRENDS TECHNOLOGY LTD.
35 NORTH AUDLEY ST.
LONDON W1Y 1WG.

I ENCLOSE CHEQUE/PO FOR £.....
PLEASE SEND ME.....
NAME.....
ADDRESS.....
.....
.....POSTAL CODE.....

PLEASE CALL BEFORE ORDERING FOR CARRIAGE CHARGES 01-409 0766

VIC 20 WORD PROCESSOR — VICTEXT

Powerful word processor. Facilities include:— Large text buffer, auto centre text, variable tab, insert, amend, delete, copy, move text, word count, right justify etc. Fully menu driven with comprehensive easy to use instructions. Great value.

VIC 20 + 16K cassette **£6.95**
VIC 20 + 16K disk **£9.45**

VIC 20 FILE — DATA FILE

Takes the place of any card index. Facilities include:— save, load, file, full sort, print all – part records, amend, delete records, memory remaining etc.

VIC 20 (+8K min.) cassette **£4.50**

All programs with full documentation and guarantee and can be used with all direct connect VIC printers including 1520 printer – plotter and most Centronics (with suitable hardware interface) if required. Price includes VAT, packing and fast delivery by 1st class mail.
Cheques – PO's to:

A & C SOFTWARE
Dept. 1, 75 Oakthorp Gardens,
Tividale, West Midlands B69 2LF
Tel: 021 557 8596

BASIC

MOB64 — The ultimate sprite drawing utility. Stores up to 340 simple and multicolour sprites. Quite simply the best!

MAC64 — Machine code utility with some great routines which you can call up from Basic. Includes save-with-autorun, programme recovery after NEW, screen invert, screen reverse, joystick control, screen explode etc.

FONT64 — Alternate character utility. Predefined alternate character sets include 'cheque book' characters, Greek letters, mathematical symbols etc. plus a complete programme for drawing and editing your own characters.

ALIEN ATTACK — The ONLY deliberately alterable machine code arcade game. Create and save your own variation. Full instructions given.

Each programme on cassette for the Commodore 64 £5.00. Send cheque/PO to:

BASIC, 4 Chapel Villas, Dalgety Bay, Dunfermline, Fife. Tel: 0383 823745

ANSWER BACK

Hi-res Raeto

CAN YOU tell me how to make the whole screen high resolution on the 16K Vic? The Programmers' Reference Guide doesn't cover this, and Commodore has been unable to help me. Can you explain how to do this and how to plot point on the hi-res screen?
T Elleston
Hayle
Cornwall
THE REFERENCE book you need is Raeto West's Programming the Vic, which is available from Biblios, Star Road, Partridge Green, Horsham, Sussex. On page 421 you'll find a Basic program for full-screen joystick-controlled plotting in hi-res mode. The program allows plotting and a screen 20 columns by 24 rows in size, in full colour.

Losing pounds

I USE THE brilliant Vizawrite word processor with my 64 and Brother HR15 printer, and have always found Calvin Lacy and Viza to be very helpful in sorting out problems. It's grand to find a software supplier who cares about what happens to customers after they've paid for the goods!

Now I'm looking for someone who can tell me how on earth to print the £ sign. It's there on the daisywheel, but just you try to print it... when it comes to manuals, the Brother HR15 surely takes the booby prize. Any knights in shining armour out there?
J Dick
Chapel En Le Frith
Derbyshire
THE £ SIGN is character 92 on the 64, and may well be CHR$(35) or £/ on your HR15. It's a matter of trial and error to work it out. Try £/ first, and if that does not print out £ then use a loop as follows;
10 OPEN 1,4
20 FOR I = 33 TO 127
30 PRINT#4,CHR$(I);NEXT
50 CLOSE1

This should print all the characters on the print wheel and enable you to establish which character corresponds to £. Failing that, your printer may require an escape sequence to be sent in order to access other parts of the print wheel. CHR$(27) is normally sent as Escape, but it's possible your printer may require two characters to be sent. Read your manual carefully and see what is mentioned about escape sequences. It may now make more sense to you.

Going Forth

Is there a version of Forth on disk for the Vic 20? I have the cartridge Forth from Datatronic, but I can't find a disk version.
David Carroll
Middleway
London
YOU CAN get Tiny Forth on disk from Abacus, via Adamsoft, 18 Norwich Avenue, Rochdale, Lancs, 0706-524304. The program requires a Vic with at least 8K expansion, and is also available for the 64.

Superbase solution

I HAVE A 64, a 1541 and a KDC FT-5001 which has a centronics parallel interface. I had hoped to use Precision Software's Superbase, which is excellent, but I can't find an interface which allows me to use it with the printer. It seems that all the software based interfaces reside in part of the memory used by Superbase. Can you suggest a reasonably priced interface which will not interfere with the program?
P J C Buxton
Truro
Cornwall
ALL YOU need is a Printlink 64 interface cable available from Microport of 7 Clydesdale Close, Boreham Wood, Herts, 01-953 8385. The cable costs around £18. Superbase has a software driver routine which provides all the software needed, and if you want to use the Printlink outside Superbase you can buy a software package from Microport for £8.

Pay your money . . .

I HAVE A 64 with a 1541 and a Shinwa CP80 printer, and a Trippler printer interface. Could you suggest a suitable payroll program which would cover around 30 employees?
Roy Walmsley
Windermere
Cumbria
YOU COULD try Payroll Plus 64 from Landsoft, 28 Sheen Lane, London SW14, 01-878 7044. This program caters for up to 100 employees and has no special printer requirements, but it does not provide for statutory sick pay calculations. There is a phone service in case of problems and the program seems easy to use.

Pseudo-random

I HAVE recently discovered a fault on the Commodore 64. After using a short program to generate a random number, I have found that after turning the computer off and trying again the same random number is generated. Could you explain?
Chris Watson
Burnley
Lancs
THE VALUES produced by the 64's random number generator using RND are always the same when using a positive argument; this is not a fault, and can be used to good effect in some programs. The way to produce a genuinely random number is to use RND(-TI) as a seed for the number generator, and in a later line use RND(1) for your sequence. Try (from power on)
10 S = RND(-TI)
20 FORJ = 1T020
30 PRINTRND(1)
40 NEXT

80 column scream

I HAVE A 64 with 1541 disk drive, 1701 monitor and Brother HR15 printer. Using Easy Script I find I have a very good word processing system, but I find the 40 character width screen a drawback. Is there any way I can use this equipment with a module or disk based program to increase the screen width to 80 characters?
R Watkin
Chester
Cheshire
I DON'T know of a way of using Easy Script with an 80 column conversion, but even if I did I wouldn't recommend it — the 80 column system I've seen can give you a serious case of eye strain!

Try using the Paper Clip word processor, which can be scrolled across while being ouput to the screen.

VAT attack

MY FATHER runs a shop and has problems with VAT. He has asked me to buy a program for my Vic 20 which will work out 15% of a string of numbers fed into it, but I haven't been able to find one. Can you make any suggestions?
D Ward
Louth
Lincs
IT'S VERY simple to carry out this type of calculation in Basic. Try the following program, which will work for any Commodore computer.
10 T = 0
20 PRINT" (CLR) ENTER NUMBER"
30 PRINT" (-999 TO END)
40 INPUTN:IFN = -999 THEN60
50 T = T + N:GOT020
60PRINT"TOTAL VAT AT 15% OF "T" = £".15*T

If you need help with a technical query or problem write to Jack Cohen, Commodore Horizons, 12-13 Little Newport Street, London WC2H 7PP

DO MORE WITH YOUR COMMODORE

MAKE THE MOST OF YOUR COMMODORE COMPUTER WITH THESE BOOKS AND SOFTWARE – THERE'S SOMETHING HERE FOR EVERYONE.

COMMODORE 16

Gateway to Computing with the Commodore 16, Books 1 and 2
'Enter the gateway' and discover a new fun approach to computing and the 16 when you encounter a cast of colourful characters, problems, puzzles and projects. Start from scratch with Book 1 then develop your programming and other skills with Book 2. Ideal for the young – and young at heart!
£4.95 each/ Shiva Books/ Ian Stewart & Robin Jones
(Book 1: ISBN 1 85014 009X: Book 2: ISBN 1 85014 010 3)

Easy Programming: Commodore 16
Ideal for newcomers to computing, this book is a thorough and entertaining introduction to programming on the new C 16.
£5.95 Shiva Book/ Ian Stewart & Robin Jones *(ISBN 1 85014 008 1)*

Commodore 16 Machine Code
Covers every aspect of machine code programming on the C 16, from screen control and graphics to assembly language and debugging techniques.
£6.95 Shiva Book/ Ian Stewart & Robin Jones *(ISBN 1 85014 012 X)*

COMMODORE PLUS/4

Commodore Plus/4 Machine Code
Everything you need to know about machine code programming for the new Commodore Plus/4 – screen and keyboard control, moving graphics and colour – plus descriptions of all the facilities of TEDMON, the C Plus/4's built-in machine code monitor. Packed with simple programs and advice to help you develop your C Plus/4 machine code.
£6.95 Shiva Book/ Ian Stewart & Robin Jones *(ISBN 1 85014 014 6)*

The Plus/4 Programmer
£6.95 Shiva Book/ Ian Stewart & Robin Jones *(ISBN 1 85014 077 4)*

COMMODORE 64 + VIC 20

Commodore Peripherals: A User's Guide
Want to add to your basic 64 or VIC system? Find your way through the peripherals jungle with this easy guide!
£7.95 Compute! Book/ Julie Knott & David Prochnow *(ISBN 0 942386 56 6)*

Compute!'s Commodore Collection Volume 2: Programs for the VIC and 64
£10.95 Compute! Book *(ISBN 0 942386 70 1)*

Compute!'s Third Book of Commodore 64
Outstanding games, applications, tutorials and utilities from Compute!'s magazine and Gazette – plus several never-before-published programs.
£10.95 Compute! Book *(ISBN 0 942386 72 8)*

Gateway to Computing with the Commodore, Books 1 and 2
£4.95 each/ Shiva Books/ Ian Stewart
(Book 1: ISBN 1 85014 017 0. Book 2: ISBN 1 85014 035 9)

Commodore 64 Programmer's Notebook
First-time users and experienced programmers – cut down errors and ease frustration with this programmer's answer guide, which fills the gap left between the Owner's Manual and the Programmer's Reference Guide and shows you how to master BASIC on the 64.
£14.95 HRW Book/ Earl Savage *(ISBN 0 03 001294 5)*

Mind Moves: Strategic Brain Games for the Commodore 64
Tired of playing arcade games? Looking for strategy games that will challenge and entertain you and your family? Look no further! The eight intriguing games in *Mind Moves* feature strategy, words, adventure, resource management, and much more.
£18.49 dilithium Press/ Book + Disk *(ISBN 0 88056 225 0)*

Golden Flutes and Great Escapes for the Commodore 64
Create your own games for the 64 with this straightforward guide – all you need is a small amount of BASIC programming knowledge. Four *complete* game programs are included, ready to run on disk – Golden Flutes, Great Escapes, Mars, and Treasure Hunt – with full explanations of how everything works. Check them out – then use the book to start programming your own adventure fantasies!
£18.38 dilithium Press/ Book + Disk *(ISBN 0 88056 204 8)*

Colour and Graphics for the Commodore 64
£13.95 HRW Book/ Andrew Veronis *(ISBN 0 03 000052 1)*

Compute!'s Reference Guide to CP/M on the Commodore 64 Volume 1
Everything you need to get the most out of Commodore's CP/M package and customise it to suit your own needs.
£11.95 Compute! Book/ James Doody *(ISBN 0 942386 65 5)*

Available from large branches of Boots, Menzies, W. H. Smith and bookshops, computer shops and department stores: or direct from the distributor by filling in the coupon below and sending it with your payment to HOLT SAUNDERS LTD, ACCOUNTS DEPT., 1 ST ANNE'S ROAD, EASTBOURNE BN21 3UN. Please make cheques payable to **Holt Saunders Ltd** *and allow 28 days for delivery.*

Free postage & packing on all UK orders

WRITE OR PHONE FOR YOUR FREE CATALOGUE

ORDER FORM

Please send me

ISBN	TITLE	QTY	TOTAL PRICE

I enclose payment of £..... by cheque ☐
or debit my credit card:
Amex ☐ Diners Club ☐ Visa ☐ Access ☐ (please tick)
Credit card number

Name (please print) _____ CH 485

Address _____

_____

Telephone _____ Signed _____

Telephone credit card sales welcome – just dial 100 (UK only) and ask the operator for FREEPHONE 2568

SHIVA PUBLISHING LTD · COMPUTE! · dilithium Press · Holt, Rinehart and Winston from HOLT SAUNDERS

DER

Win a new TV/monitor

IF YOU'RE tired of using your computer with an old black-and-white portable TV, or fed up with endless arguments over who gets to use the family set, **DER** has the solution.

The **Ferguson MC01** is a full-function portable colour TV, but because it has DIN sockets for direct RGB and composite video input it also functions as a computer monitor. Because the signal isn't demodulated before being transmitted to the screen, the result is a sharp picture and clear sound. The MC01 TV/Monitor normally costs £225, including the appropriate connection lead for your CBM or Vic 20, or it can be hired from DER showrooms for £8.95 per month.

To win an MC01 donated by DER, all you have to do is put in order of merit the various features of the unit. For instance, if you think the most important feature is "easily portable" then mark on your entry 1; C — and so on through to 6.

When you've done that, complete the following tie-breaker in an apt, amusing and original manner in fifteen words or fewer; "DER puts you in the picture because . . ."

Add your name and address and send your entry on a POSTCARD to **DER Contest, Commodore Horizons, 12/13 Little Newport Street, London WC2H 7PP,** to arrive by the last day of March. Results will be announced in the May issue. Normal competition rules apply.

* A Direct input for a sharp, clear picture

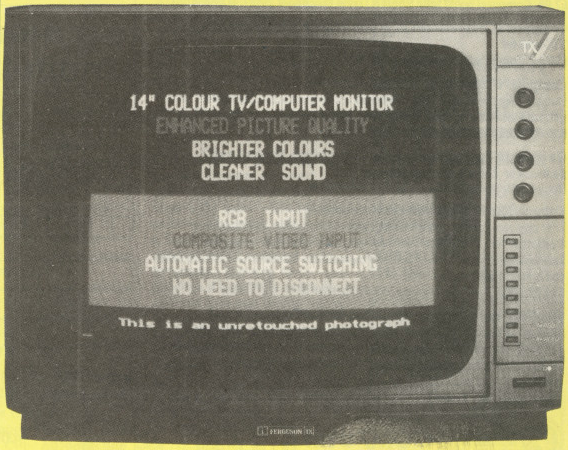
* B No hiss or hum on the sound

* C Easily portable for use in any room

* D Automatic source switching — no need to change connections

* E Full-function colour TV with Ferguson picture quality

* F Modern styling at an affordable price



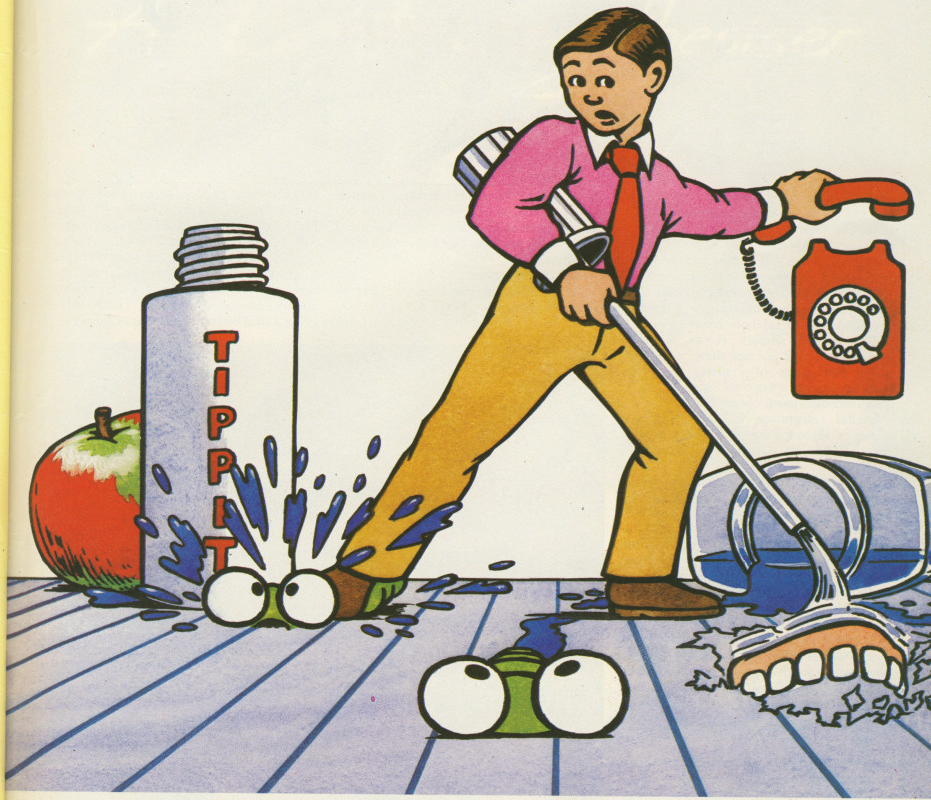
The results of the January **Beyond Software** competition are as follows: the overall winner is M Trigger of Barnstaple, who receives copies of **Psi Warrior, Psytron** and **Lords of Midnight.** The first 20 runners-up receive copies of **Psi Warrior;** Stephen Foster-Basin, Blandsford; M J Davies, Llandeilo; P O'Connell, Newcastle; R Richardson, Scunthorpe; M Bukaczewski, Thornton Heath; S Sullivan, Hoddesdon; David Gibbons, Galway; P McMullan, Adlington; John Whitehead, Tadworth; G J Webster, Leeds; G Nandhra, Birmingham; P B Jones, Milford Haven; I M McKinley, Inverclyde; C J Naunton, Littleover; P Uustal, Mablethorpe; R G Champion, Chineham; R Smythe, Manchester; W Sinclair, Orkney; C Belton, Henfield; M A Hitchinson, Llandudno.

The second 20 runner-ups receive copies of **Psytron** for the 64. R. Scaife, Gosforth; R Palmer, Stafford; S McCarthy, Newark; E M Howell, Bristol; S Conway, Kilkenny; J Cosworth, Stoke; S Skinner, Nottingham; M J Williamson, Boston; M LeVallois, Renfrewshire; P Mantz, Portsmouth; A Cieciala, Rawdon; M K Izzard, Reading; G P W Way, Plymouth; A Marsh, Wotton; D J Stokes, Birmingham; P Betts, Plymouth; D Wright, Horsham; K Evans, Liverpool; M Perry, Crayford; H Harrison, Stoke-on-Trent.

Every entrant will receive free membership of the Beyond Club, and a voucher entitling them to £1 off the Beyond game of their choice with the next edition of the club newsletter published in May.

QUINX

for Commodore 64



Available now, price £6.95, from your Dealer or
SUPERSOFT, WINCHESTER HOUSE, CANNING ROAD, HARROW

YOU TOO can be a high flier with **Digital Integration's** exciting combat flight simulator **Fighter Pilot**. The Commodore 64 game, reviewed in last month's issue, puts you in the pilot's seat of an F-15 Eagle jet fighter. Your mission is to take off from your home base, track enemy aircraft with your tactical radar, intercept and destroy them, and return safely to base.

The cockpit display is an accurate simulation of the genuine thing, and there are a full range of controls to affect altitude, pitch, weapons status, trim, undercarriage, guns, speed, and more.

Digital Integration is offering twenty copies of Fighter Pilot 64, which normally costs £9.95, to Commodore Horizons readers.

All you have to do is look at the map and follow these instructions. Each square is one mile on each side.

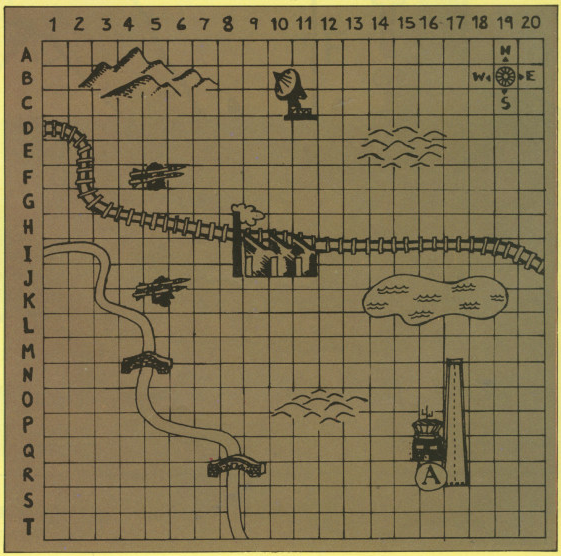
Starting from point A, you taxi onto the runway and take off heading north. After passing over a body of water you alter course to north-west and fly for one minute at 600 miles per hour. You spot an enemy installation and alter course due west. Flying at 1200 miles per hour for a quarter of a minute, you then veer south for three miles, and, coming under enemy attack, alter course south-west until you pass over a body of water. You then fly south-east for seven miles, when your fuel warning light goes on. You have to send out a distress call — but what are your co-ordinates?

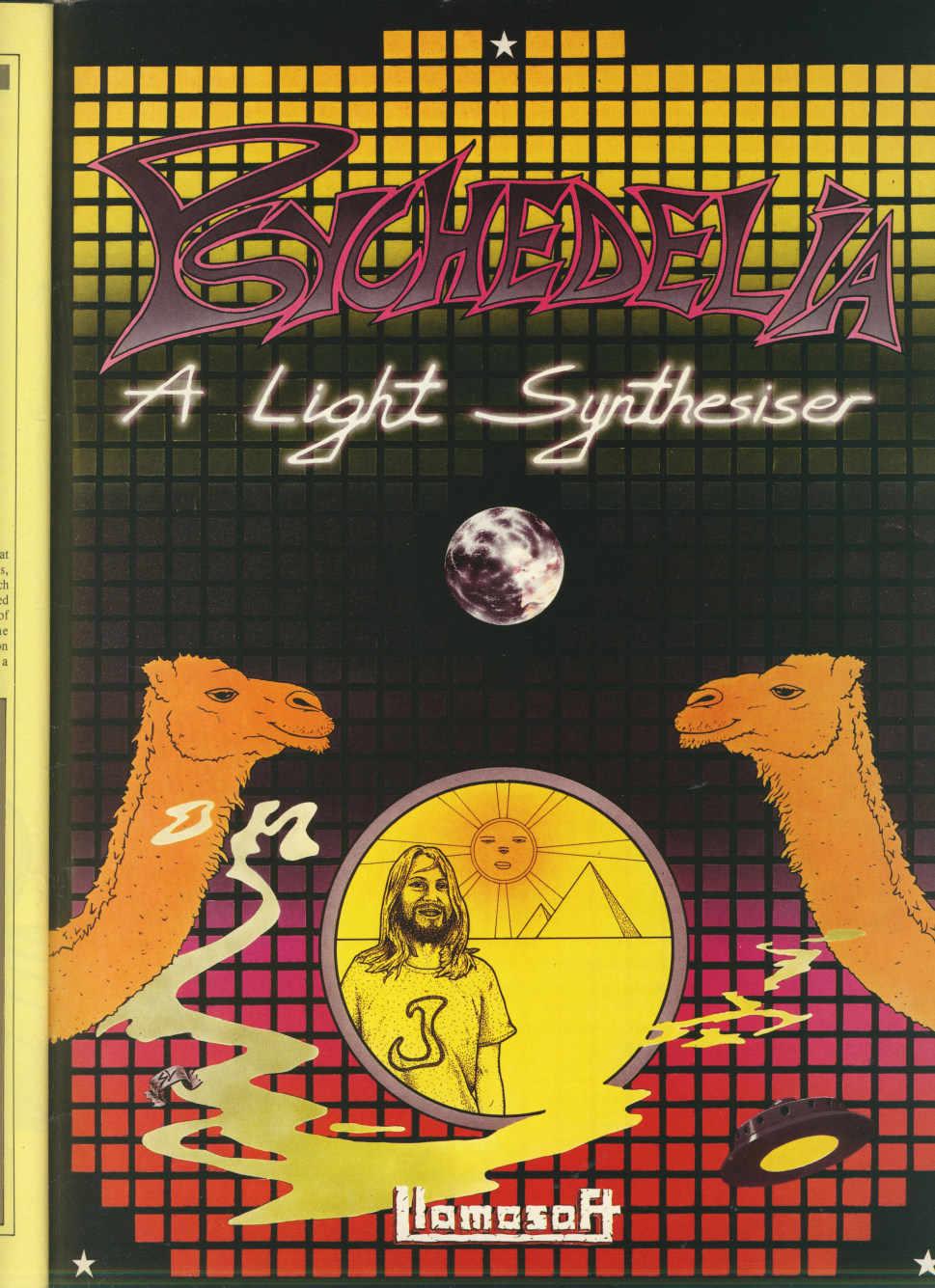
To win a copy of Fighter Pilot, write down the number-letter code for the square, then complete the tie-breaker in an apt, amusing and original manner in fifteen words of fewer; "I want to reach for the skies with Fighter Pilot because..."

Send your entries on a POSTCARD with your name and address to **Fighter Pilot Competition, Commodore Horizons, 12/13 Little Newport Street, London WC2H 7PP.** Competition closes on the last day of March and results will be announced in the May edition. Normal competition rules apply.

Previous winners:

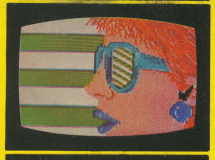
The winners of the January **Cheetah RAT** competition are Mark Riley, Harlow; Jamie Roche, Poole; R Palmer, Stafford; M LeVallois, Paisley; Dean Owen, Great Harwood; P Busby, Hull; P Betts, Plymouth; and H Jones, Stretton. Each will receive a Cheetah RAT infra-red joystick plus a copy of the game Perils of Bear George. The winner of the November **Dixon's Telescope** competition is C M Terry of Nottingham. The prize is a Prinz Astral 400 telescope from Dixon's.

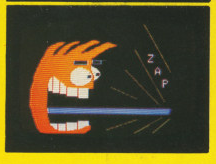



PSYCHEDELIA
A Light Synthesiser
Llamasoft

KoalaPad™ TouchTablet

JUST PICTURE IT!





JUST PICTURE IT - BEING ABLE TO DRAW YOUR OWN HIGH RESOLUTION GRAPHIC DESIGNS ON YOUR COMPUTER SCREEN WITHOUT HAVING TO WRITE A PROGRAM . . . !

Well, now you can - with the amazing Koala Pad from Audiogenic!

The Koala Pad touch tablet provides the direct link between you and your screen! It plugs into your Commodore 64 and lets you paint directly onto the screen with a selection of brush sizes and a choice of 16 colours and 16 shades from your software pallette.

But that's just the beginning - because every Koala Pad package includes the incredible Koala Painter software which makes it child's play to . . .

- ***Fill outlines with a colour!***
- ***Draw straight lines!***
- ***Make frames!***
- ***Draw circles!***
- ***Plot radians from a point!***
- ***Move objects around!***
- ***Copy shapes!***
- ***Create mirror images!***
- ***Zoom in on an area!***
- ***Swap shapes between two pictures!***
- ***Save your pictures to disk or tape!***

The program is controlled entirely from the tablet by moving a cursor arrow around to the different menu option. An optional Programmers Guide is also available to tell you how to incorporate Koala Pad pictures into your own programs.

Now you don't have to be an experienced programmer to produce real high resolution graphics on your computer - the Koala Pad from Audiogenic makes it as easy as a pencil and paper. Just picture it!

Available with Cassette or Disk software for the commodore 64

From all good computer shops - or direct from Audiogenic - just fill in the coupon!

Please send me ..... (QTY) Koala Pad Disk/Cassette*. I enclose cheque/P.O. for .....

Commodore 64 Disk or Cassette £79.95 †

THE KOALA PAD IS A PRODUCT OF

Koala™ Technologies Corporation

†Price subject to change without notice

*Please charge to my Access/Barclaycard/Trustcard account no:

*Delete/complete as applicable

Signature

Mr/Mrs/Miss

Address

Exclusive distribution in U.K. and Eire by

Audiogenic LTD

P.O. BOX 88, READING, BERKS.