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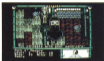
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**ARGUS
PRESS
GROUP**

Watch out for our Hardware Buyer's Guide - in issue November 1988.



DATA STATEMENTS

Combat Simulation

Argus Press Software have got themselves in dangerous waters with their submarine simulation, *The Hunt for Red October*. The storyline has been taken from Tom Clancy's best selling novel and you play the part of a defector in command of a submarine that is being hunted by the elite Russian Navy. Your aim is to make a rendezvous with the American Navy - but the Russians have other plans for you. The gameplay is detailed and challenging, providing plenty of scope for strategy and simulation fans.

The Hunt for Red October will be available soon on the Commodore 64. (Price to be announced.)

Put tactical warfare in a new dimension with Rainbow's re-released *Traveller*. The battle is fought around a military training simulator known as the Centrepoint on the planet Egoon. The planet's advanced Cycloid robots now control the complex and it's all down to you to destroy the Centrepoint computer.



The Hunt for Red October



You'll need your wits about you to fight the frantic battle which combines fast strategic manoeuvring with high speed solid graphic 3-D battle sequences. It's all down to you to wipe out the distraction hordes of

renegade Cycloids with simultaneous control of up to eight submarine craft. *Traveller* is available on the Commodore 64, priced at £14.95 (C64) and £17.95 (Disk).

Traveller

Argus Press Software: *Hunt for Red October*, Letterbox Place, London WC2F 9NB, Tel: 01-439 0800.

Rainbow Software: *Traveller*, Willoway House, Upper Martins Lane, London WC2M 9PL, Tel: 01-240 8038.

Win a Weekend Break

Softsell, the distributors of microcomputer hardware and software products have organised a promotion which offers Softsell dealers who buy ten or more Migret products a chance to enter a draw for a free weekend for two in the UK.

Peter Scatchard, Marketing Manager for Softsell comments: "Softsell will be offering a free unit for every ten Migret products purchased, in addition to the free draw for a weekend break."

Migret now produce a graphics package in the form of Page Ability, which is aimed at the desktop publishing market and priced at £39. The Page Ability is fully integrated with the rest of Migret's range which consists of Ability (£39), Ability Plus (£39) and the Account-Ability - the complete small business and personal accountant (£39).

Traveller

Softsell: Softsell House, Seven Oaks Way, Grove West Road, Borehampton, Middlesex TW9 9SD, Tel: 01-867 8868.

Bizzy-Body

Bizzytax is the new service, available on Prestel which is aimed at the small businessman and includes everything from on-line tax and legal advice to information on pension schemes, money and stocks and shares. Users can send experts questions electronically and then read the replies on their terminal at home or in the office. An on-line consultancy service, run by M.A.S. is also on offer. Other features of Bizzytax include insurance, investments, DHSS, raising a small business, start-up seminars and property.

Microtel's Commercial Director Simon D'Arny commented, "Bizzytax is aimed at those people who already have a PC, but are looking to get more value out of it. It brings the advantages of instant information and interaction to the businessman."

Traveller

Microtel: Carran House, 2 Perchard Way, London EC7M 3EL, Tel: 01-278 3142.

The Choice is Yours

Let's hope Mary Whitehouse doesn't read the computer press, as I'm sure this recent release from Virgin would cause her to throw up her arms in disgust! How so? *Complete Husband* is exactly that - based on Adrian Edmondson's book, the game allows you to go to a party, and basically cause havoc.

You go by the name of Ade and one of the game is to score as many husband points as possible and light up every letter in the phrase 'complete husband' by particularly devious behaviour. The game features 'hostile' which allows you to see what's going on in all corners of the house, so as not to lose a chance of being horrible slip away.

If this sort of game turns you on, it's available on the Commodore 64/128, priced at 29.95 (C64).

Traveller

Virgin: 24 Fenny Field, Parkside Road, London W13 2JH, Tel: 01-737 8070.

On the Hardware Front

The Competition Pro Extra is a new joystick now available from Dynamics Marketing Ltd. The joystick, priced at £16.95, features an auto-fire option with slow motion movement for better control in sticky situations.

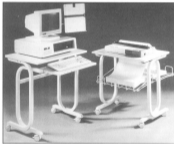
Dynamics' Kevin Parsons, General Manager comments, "We know that the new Pro Extra with rapid-fire will fill a need in the market but the Competition Pro 500 joystick continues to be our main product bought by discerning users throughout the world."

In a bid to make the computerised office a safer place, Arcadon are launching a new range of computer equipment and accessories. The products include the PCMan priced at £119, which comprises a range of personal computer and printer furniture; Keyboard Slideaway priced at £29, which enables the PC keyboard to slide under the monitor when not in use, which saves desk-space and protects the keyboard from dust and spills; the Printer Muffler which is a range of acoustic hoods for 80 and 132 column printers, which can reduce noise by up to 80% (80 - 80 printers, 55 - 102 column printers). Also Diskette Fire Safe, priced at £325, which has a capacity of 105 5 $\frac{1}{4}$ " or 3 $\frac{1}{2}$ " disks and Data Cartridge Rests, priced at £17.50 and £19.90, which have been designed for convenient filing and retrieval of up to ten standard or mini data cartridges.

Touchlines:

Dynamics Marketing Ltd, Core House, New Court Street, Exeter, Devon, GL2 6JZ, Tel 067-626 2222

Arcadon, Howard Drive, Malvern, West Midlands B67 5AN Tel 021-350 4646



Arcade Action

Can you free your father from the urban jail in Mean City? This is the question that a new release from Quiksilver asks in Mean City. You play the part of Sam, son of mutant rebel leader Hanta, and it is your task to free your father from the jail in the city of Concorc 2-G-Gow. It is also a battle against your cousin - Cate - who eventually wants to lead Concorc, and the only way he can do this is by going to your father before

you and killing him. To free your father you must collect four parts of the key, and all the time you have to be on the look out for your opposers who appear in the form of city citizens, police, enforcer druids and the anti-mutant league!

Available on the Commodore 64, priced at £9.95 (Colo) and £14.95 (Disk).

In *Quiksilver*, a further Quiksilver release, you have to hunt for the famous, brainy professor - Dr Eysenaid. An asteroid is about to collide with Earth and the only person that can help is you - you've guessed it

- Professor Eysenaid! But first, you've got to find him. Packed with humour and action it's up to you to find the Prof, persuade him to help and then collect the equipment he needs to put his defence plan into operation.

Quiksilver is available on the Commodore 64/128, priced as to be announced.

Arceps by Microsoft enables you to become a master investigator by solving the case of a missing person. It is very important that you find this missing person as it happens to be your brother - Joe. You find out that Joe, a

DATA STATEMENTS



Two out of three are Madballs - the other one's!

private investigator, has been working on a case that involves a dangerous virus that may be released into the air of our nation's capital. It's all down to you to deactivate the device that will unleash the crippling virus, and name the villain behind the crime. Successful hunting!

Dustbrin is available on the Commodore 64. (Price to be announced.)

Known to be released from *Clean* is *Madballs*, featuring those wild and wacky toy characters. This action-packed game features *Dust Brain* (a dried-up mummy head which is not too tightly wrapped) who is a member of the notorious Madballs political party who are the current rulers of the planet Orb. However, *Dust Brain* is convinced that his politics are right and sets out on a bureaucracy-bashing exercise to eliminate the opposition. You play the role of *Dust Brain* and it's your aim to convince the rest of the Madballs to favour your politics.

Available on the Commodore 64, priced at £8.99.

Fan and games are in store with *Amster* seen to be available from Rainbow. The game is set in the land of Aquantia - a land which has been protected by a magical charm bracelet - but is now under the control of the Green Witches. It's up to you to find and link together the seven charms of the bracelet, and only then will harmony be restored to Aquantia. To keep up with the Rainbow tradition, the game is packed full of puzzles, graphics and extensive descriptions.

Available on the Commodore 64/128, priced at £18.99 (Disk).

CRI's recent release, *J. Allen - Master* by *Alan* puts you in immediate danger of becoming a guinea pig for new laboratory specimens to cultivate a new food source. This is due to a nuclear war wiping out Earth's entire animal population and planets are now being combed and to their experiments can begin.

Your only means of escape is your pod, which will take you to another planet for help. But of course there are many obstacles en route to your pod, which include druids, ice dragons and monsters.

Available on the Commodore 64, priced at £9.99 (C64) and £14.99 (Disk).

Ninja Master is now available on the Commodore, and promises not to be your run-of-the-mill karate game. On return from foreign conquests, *Ninja Master* returns home to find his village in the evil grip of his arch nemesis *Snake Rat* and *The Lizard of Death*. *Ninja Master* launches his quest to rid his village of evil in a frenzy of flying fists, gnashing teeth and kicking feet.

Available on the Commodore 64, priced at £8.95 (C64) and £14.95 (Disk).

Now available on the Commodore is the popular coin-up arcade game, *Super Space*. Available from *Electric Dreams*, the game offers intense head-to-head racing action from a bird's eye view point. Lots of fun to be had with eight different tracks to negotiate, which includes jump ramps, opening and closing gates, hidden short cuts

and under passes and banked corners.

Super Space is available on the Commodore 64/128, priced at £9.99 (C64) and £14.99 (Disk).

Bangkok Knights from *System 3* brings all the thrills and spills of Thailand's martial art, *Unging Muay Thai* (Thai boxing) you must fight your way from the cliff ledges above your village, through the jungle and onto the streets of Bangkok. Only when you have got this far, and beaten street opponents can you enter the Lumpini stadium where you will encounter the greatest opponents of the sport - the *Bangkok Knights*.

Available on the Commodore 64/128, priced at £9.99 (C64) and £14.99 (Disk).

Titles:

Amster/Amster Press Software; *Victory House*; *Litavore House* WPC/MSI; *TRC*; *TRC* Tel: 01-439 8666.

Amster/Amster House, 66-73 Silver Lane, London EC4P 4AB; Tel: 01-737 8643.

Electric Dreams/Activision, *Activision House*, 23 Pond Street, Hampstead, London NW3 3PN; Tel: 01-433 1303.

System 3 Software/Activision, 23 Pond Street, Hampstead, London NW3 3PN; Tel: 01-433 1303.

CRI, CRI House, 9 Aylesford Coppeners Road, London E3 5JF; Tel: 01-532 2948.

Electric Dreams/Activision, *Activision House*, 23 Pond Street, Hampstead, London NW3 3PN; Tel: 01-433 1303.

System 3 Software/Activision, 23 Pond Street, Hampstead, London NW3 3PN; Tel: 01-433 1303.

A Matter of Scruples

Based on the popular (or not so popular) board game, *Litavore Genesis* (Virginia) are due to release the computer version. In addition to 200 questions of moral dilemmas, the computer edition has an exciting array of computer people with simulated intelligence to play with you (that's if you can't stand up the real thing). There are 64 computer personalities which are pre-decided and human players must select their looks from a gallery of faces, and then adjust their personalities by means of character attributes.

Available on the Commodore 64/128, priced at £12.95 (C64) £14.95 (Disk).

Titles:

Virgin, 3-4 Farnham Road, Putney, London W11 2DA; Tel: 01-737 8070.

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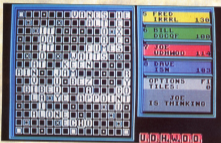
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SCRABBLE

Word games fans everywhere will be sitting up and taking notice of this latest release from Leisure Games, as it provides the only thing missing in the normal game of Scrabble – opponents. As a small quiz for word fans, which of the following two letter words would be allowed – at, da, jo, it and yo?

Although other humans can play, the effect isn't particularly startling as you are forever having to send people out of the room so that they can't see your tiles. You can play against up to three opponents and choose from up to eight skill levels for each. Levels one to four are relatively easy. An extra section of obscure words is accessed for the higher levels.

The computer boasts a vocabulary of some twenty thousand words. This means that there are going to be quite a few occasions when you play a word that it doesn't recognise. It will then challenge you and ask whether that word was correct or not. This is fair enough, but I suspect that if you are the sort of person who plays 'NQM' on a triple word score, you are not going to remember it when challenged.

Another feature is that you can now play against the clock. A time limit per move of anything between ten seconds and ten minutes can be set.

The board is a fairly confusing display but, as they say, it's the game's the thing and I was very pleasantly surprised at the quality of the game it gave me. It has a tendency to close the board down whenever possible so you will have to do your homework and hang on to all those little two letter words.

In answer to the quiz above, they are all OK, meaning a they could slash, a baroque knife, a beloved one, baby and precious (and respect only). Be warned, the computer knows at least four of the five.

Finalfile:

TM: Computer Scrabble Deluxe, Supplier Leisure Games/Virgin Games, 2-6 Porton Road, Puttenham Road, London W71 3AQ. Tel: 01-727 8000. Machine Cost: £12.95 (Cds £14.95 (5cds))

Developer: V/S. **Graphics:** V/S. **Playability:** V/S. **Value:** C/B/L.

Cardboard 5

*Five cartridges into one slot will go with this useful
C64/C128 add-on.*

By Stuart Cooke

If, like myself, you have a number of cartridges that you use often, it can be a real pain repeatedly turning off your C64, pulling out the cartridge, putting the new one in, loading the software that you were looking at and then starting all over again. Well the Cardboard 5, available from Precision Software will change all of that.

Essentially the Cardboard 5 is a cartridge expansion board. It comes complete with five replicas of the normal Commodore cartridge port on it. A series of switches allow you to have a cartridge in each of these slots. Moving the switches and pressing the reset button, provided on the Cardboard 5, allows you to change the cartridge in use, without resorting to powering down your computer.

Backlog Illumination

Beside each of the cartridge slots there is a series of LEDs. These small lights allow you to monitor the behaviour of the following lines:

Power indicator for each cartridge
Cartridge Request Enable
XROM request for each cartridge
GAME ROM request for each cartridge.

With five cartridges installed the board starts to take on the appearance of the proverbial Christmas tree.

Knowledge of what each light refers to is required as it is important to know at a glance which cartridges are powered up and selected for use. A knowledge of what the lights mean is also useful when setting up for operation.

Switching them in

The various switches that are on the board allow you to set up each of the expansion slots to operate in different ways. Careful monitoring of the LEDs, already mentioned, together with careful experimentation with the switches should give you the correct positions for the switches for certain cartridges.

The reason for the various switching options is due to the increasingly complex way in which manufacturers are designing their cartridges.

Seeing and what switch combination to use with each cartridge should cause no problems, as long as you follow the instructions given in the extremely clear manual, even though this doesn't claim to give all of the answers.

Neat tricks

Not only does the Cardboard 5 give you the ability to change the cartridge selected for operation with ease, it also gives a couple of extra features.

Firstly, so long as the power switch for a specific cartridge is off, you can unplug cartridges from the expansion board, or even plug new ones in. This feature is extremely handy if you have more than five cartridges that you use.

Secondly, if you have two cartridges that don't use the same area of memory you can have them both enabled at the same time.

Let's say that you had a wordprocessor on cartridge and a fast load cartridge. Wouldn't it be great if

you could use them both at the same time? So long as the cartridges don't use the same areas of memory then with Cardboard 5 you will be able to use both together giving you not only an instant wordprocessor but also that slick screen.

I must admit that I didn't manage to try the above claim out, since all of my cartridges are utilities and use similar areas in the C64's memory.

Construction

I feel that the construction of the Cardboard 5 could have been a little better. The underside of the board is simply covered with expanded polystyrene; this becomes the base that the Cardboard 5 sits on. The top of the case is fairly rugged plastic. Why couldn't the whole board have been covered with the plastic case? It would have made the whole product a lot more sturdy.

Using the expansion card provided no problems at all. I eventually got the card to work with all my cartridges, after messing around with various switches. The Expansion card is presently sitting at the back of my 64 with my most regularly used cartridges plugged in, ready for use at any time.

If like me, you use a number of cartridges on a regular basis then the Cardboard 5 is just what you've been waiting for.

Finalize

Name: Cardboard 5. **Supplier:** Precision Software, 4 Park Terrace, Worcester Park, Surrey KT7 1JZ. Tel: 01-89 7765. Price: £29.99 (inc. VAT).

Using the Z80 Microprocessor on the C128

Did you realize that you could see the Z80 microprocessor without running CP/M?

By Leigh Brown

As everyone that has a C128 knows, it has a Z80 used for CP/M. However, not everyone knows that you don't have to be running CP/M to use it. To facilitate the Z80, you clear bit zero of location D985 by:

```
POKE 5453, 176
```

However, this will reset the machine as the Z80 will execute an RST 08, which is the reset routine. As the next instruction is at FFEE all we need to do is replace the RST 08 with a

jump to our Z80 program. First, the Z80 program.

As the monitor only assembles 8582, enter:

```
>1480 21 48 21 11 08 20 81 08
```

```
>1488 1E ED 80 C3 60 FF
```

Now, redirect the Z80 code at FFEE:

```
>FFEE C3 00 04
```

Finally, enter the 8582 loader:

```
A 1580 SEI
```

```
A 1581 LDA # 3E
```

```
A 1582 STA FF00
```

```
A 1586 LDA # 80
```

```
A 1588 SRA D883
```

```
A 158B NOP
```

```
A 158C C11
```

```
A 158D RTS
```

To call the Z80 routine, call the routine at 1580 hex.

Finally, here is a demonstration:

```
18 GRAPHIC 1,1
```

```
26 CIRCLE 1,159,99,99
```

```
38 BANK 15
```

```
46 SYS 4884
```

```
58 END
```

Just replace my routine with yours and if you want to move the start address of your Z80 code, change the jump at FFEE. Also, the Z80 BIOS ROM is located from 0 to FFF so do not use this area for programs or data. And remember that to access the I/O area you must use the IN and OUT commands. Who knows? There may eventually be a Z80 assembler for the C128.

```
21 40 21 LD HL,2140
11 80 20 LD DE,2080
01 80 1E LD BC,1E08
ED 80 11SR
C3 00 FF JP FFEE
```

```
start address of block
destination address
number of byte to copy
copy block
return to FFEE
```

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Mastertronic

The latest catalogue from Mastertronic contains nearly 100 C64 games - look ahead at the new Autumn releases from the cut-price kings.

By Tony Hetherington

In just over three years Mastertronic has grown from the first budget software house to become a major publisher with eight software labels, including the renowned Melbourne House, a range of music cassettes and video, Arcade coin-op machines (based on two megabyte Amigas) and the marketing rights to the Sega Master System.

From Strength to Strength

The original Mastertronic range (£1.99 now boasts over 90 games that include the top-selling Formula One Simulator, which is an adventure based on Monty Python's Holy Grail, the Gauntlet Clone Storm, BMX Racers and Trials, Spool King (the motor bike game that gave the full priced Super Cycle a run for your money), the return of Tank's Super Pipeline II (in which you and your plumbers mate must battle against tuberos and Venesian Pipe spiders to fix a leaky pipe) and countless arcade and platform games including Pod, Video Maniac and Molecule Man.

It's a Mad, Mad World

Two years ago, Mastertronic launched its MAD (Mastertronic Added Dimension) range of games that cost slightly more than still only £2.99 and contained games such as Spellbound and Mastertronic that will read their full price counterparts.

Spellbound added "Wunderman" to the adventure world as an animal hero (Magic Knight) wanders through the rooms of the mythical castle of Karn in an attempt to save Gimbel the Wizard. Whenever an adventure action such as pick up, drop, read or give is required, they are selected from window menus.

Spellbound also has six incredibly unhelpful characters including Thor, who needs a hammer, Samson who is strong but what use is Florin the dwarf, Ork the Cleric, Lady Rosmar or the waiting Berser?

To succeed in your game to save yourself, Gimbel and the others, you will have to keep these characters alive and

get them to help solve a series of devious problems such as how do you get across a dark room full of explosive gas. Clew - using the candle has disastrous results!

If you've solved that then why not try to survive an exploration in dungeon of Master of Magic. A split screen display is your guide in this joystick controlled role-playing game, as you attempt to escape the deadly grip of Theoric's spell.

By selecting commands you can walk, run and flee through the caverns of this dungeon and the battle with skeletons, orcs, giant bats and vampires that are displayed in hard detail at the bottom of the screen. Defeat them and you could find magic armour, weapons, magic scrolls and rings. But may help you to survive to fight another day.

Attack of the Mutant Camels is my favourite Jet Mania game and has returned as part of the MAD range. Now for only £2.99 you can climb into your fighter and blast away at the laser ball spitting, 90 foot high, practically engineered killer camels. Manic arcade action with Mania at his best.

On Cue, Angle Ball and Morco form a trio of new games in this exceptional range. On Cue combines two excellent versions of Snooker and Pool on one tape and allows you to



Spellbound

set the power and direction of your shot, as well as the amount of spin on the cue ball for those key position shots that will beat your human or computer opponents.

Angle Ball takes pool into a dimension as you must battle



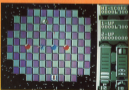
Angle Ball

against your opponent and the unusual angles based on a six-sided table!

Master is a simple-to-learn, but impossible-to-master coin-op conversion of a Namco arcade machine. In this incredibly addictive game you must defend a square grid from the invasion of the space bees. These invaders must be dismantled by shoving them off into oblivion and clearing the grid to progress to the next one where you will meet more stubborn bees that will require bonus power parts to shift them. A simple but incredibly addictive game.

Blocker is Mastertronic's (\$1.99 label that) brings back full-priced games at a budget price. The original line up of Elder Kid's Jump Challenge and Brian Jack's Superstar Challenge is now joined by the frantic but fun shoot-em up Crazy Comet and soon by the Ultimate arcade adventure Blackjackie, Dragonzale and Darlow.

America which was formerly US Gold's budget label is now with Mastertronic and features a line-up of full-priced



Beach

American software brought back for only £1.99.

Soon you'll be able to storm the beaches in the multi-stage arcade game Beach Head and in its screaming sequel Beach Head II. By daring bombing missions in Da Embazon,

fight them in the ring in Fight Nights and beat them up as Bruce Lee or a Kong Fu Master.

Each of these games has already featured at the top of the charts so represents amazing value at their new budget price.

Malibuco House, one of the oldest software houses was bought by Mastertronic and poses a new challenge. If Mastertronic already produce some budget games that are as good as full-priced games, then its own full priced games must be even better.

The first batch of releases include two conversions of Mastertronic's own Amosco coin-op games Road Wars and Rockford, and the amazing world of Metropolis.

Roadwars is a high-speed dual between two Battlebrams (you and your human or computer opponent) to clear the road that circles the Moon of Armageddon of obstacles that range from simple barriers and spikes to powerful spacehips and octonats.

In Rockford you're on your own in a fight against time to either collect the Phoenix gold coins in the Caverns of Crymbar or the Emeralds of Eremus hidden in the wilds east of Eremus or pierce the Apples of Eternal Youth from the Kingdom of Kyanada. However, these treasures aren't gained easily as you'll have to run the gamut of falling rocks, harling bats, mauling monkeys and even



Fight Nights

pot-smoking pizzas.

Soon you'll be able to enter the world of Metropolis. You come looking for a stolen tape, instead you find the once sprawling city, now empty apart from a few droids. Your job is to find out where all the people went.

Amiga owners will find cheap and cheerful games for their machine ranging from the action of Ninja Mission, Chopper X and Space Ranger to the magical world of Fend, the excitement of Vide Casino and the mind boggling hexagonal action of the six sided Pub Pool table. (All for £9.99 each.)

There's more to come not only from the labels mentioned above but also from the Redlog (£1.99) range, Entertainment USA and now from Back-It which is a joint deal between Mastertronic and Hewson!

Finally, the Sega Master System is a dedicated games console (that costs £99.99) and plugs into your TV and allows you to play coin-op conversions such as Quarter, Out Run, Enduro Racer and Space Harrier that are supplied on cartridges with as much as two megabytes of memory! **TE**

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May I Interrupt?

Interrupts are simple to create and effective in use, once you learn the secrets.

By Eric Dayle

All organizations have teams of workers behind the scenes who keep the environment clean and uncluttered. These nocturnal operations often go unnoticed and their value is frequently underestimated but without this army of night staff the wheels of industry would grind to a halt impeded by a pile of litter and dust.

Inside your Commodore there is a comparable team consisting of routines which prevent the computer from grinding to a halt.

A computer is not a very visible creature. Left to its own devices it is quite happy to refresh the powerpack screens and busy itself with the fairly demanding job of being a Commodore. Unfortunately, just "being" is not enough; a machine has to work for a living otherwise it is not a machine but an artwork or curio. To work effectively a computer must communicate with the outside world; there has to be a dialogue between man and machine.

The Secret of Communication

The only way to interact with a computer is through the use of joysticks, lightpens, graph pads or a similar peripheral device. The main method of communication is the keyboard. While I'm typing away on this wordprocessor I expect to see my perfect prose exactly reproduced on the monitor screen. The fact that the Commodore is performing individual miracles at the rate of several hundred per second does not matter, but to program the next game or utility I need to fully understand what is going on

behind the screens.

Like humans at work, the computer has two basic tasks. One is to successfully perform the job the boss wants done and the other is to stay alive while doing it. As we work so we breathe, hear, feel and see. Our hearts beat, our digestive systems churn and our glands secrete. We can control some of these functions, but often they run without us fully appreciating their presence or function.

In computer terms this self-maintenance is serviced by the *interrupt* system; a series of routines which operate so fast that they are undetectable and yet they are run sixty times every second!

Non-mask or Ask?

There are two kinds of interrupt: the non-maskable type (NMI) and the far more important interrupt request (IRQ). The NMI is of little interest other than to note that it can be caused by a peripheral device demanding attention or by the RESTORE key. In other words an NMI occurs when something shouts, "M!". An IRQ occurs every sixtieth of a second and is equivalent to the computer saying to all its peripheral devices, "OK, be quiet, what do you want? I've a million other things to do, you know."

To the computer anything other than its own "brain" is a peripheral; the video chip, disk drives, printers, cassette recorders and, most important of all, the keyboard. It is because of the frequency to the IRQ that response to a keypress is so swift as to appear instantaneous.

Although the central processing

unit (CPU) has a lot to do during an interrupt, there is still plenty of time left for other things. If we can latch our own routines onto the interrupt chain we could effectively run two programs at once.

With great forethought, the Commodore computer architects have created an interrupt servicing routine which calls upon a vector stored in RAM to see where the main interrupt routines are stored. If this vector is found we can point it to our own routines which will then be executed as though it was part of the normal IRQ.

According to the C64 memory map these locations are the two bytes starting at location 788 (\$0114).

Examining listing one, this is a standard model for replacing the old vectors with new ones. The old vectors point towards the ROM interrupt routine at \$EA31 which basically scans the keyboard. The vectors must be forced to point to \$C040 which is the location of the additional routine which exists by calling the old vectors (JMP \$EA31).

Caught Us Interrupting

The only real problem with changing vectors is that an interrupt may occur between changing location 788 and changing 789. If this did happen the interrupt would be thrown towards location \$EA40 and a system crash would occur. This has been avoided by using the SCL instruction and the following commands which prevent interrupts occurring until the CLI command is reached.

This is all there is, just put your routines at \$C040 and you need never

use any other routine to set up your interrupt.

You'll notice that the routine also changes the NMI vector at \$0118. This is just to demonstrate that NMI may be used for special RESTORE key functions. The simple routine at \$C060

merely clears the screen, disabling the RUN/STOP-RESTORE break. You did remember to save your program before running it didn't you?

While the interrupt is running you might like to type MEM and enter and run the Basic listing. You've just

turned your computer into a three-ring stack. This may seem pretty clever at the moment, but in future months I'll start going into multiple interrupts, split screens, smooth scrolling, and many of the other tricks of the professional programmers' trade. ☺

```

10 0000          ;LISTING 1
20 0000          ;SET UP FOR INTERRUPT
30 0000          LDA  #C000
40 0000 70      BEI
50 0001          ;DISABLE IRQ
60 0001 80000C  STA 80C0D
70 0004 80000D  STA 80D0D
80 0007          ;ENABLE IRQ
90 0007 80000C  LDA 80C0D
100 000A 800010  LDA 80D0D
110 000D          ;CHANGE $0314 VECTOR TO MAIN ROUTINE AT $C040
120 000D 8040   LDA #70
130 000F 801400  STA $0314
140 0012 80C0   LDA #C0
150 0014 801500  STA $0316
160 0017          ;CHANGE $0318 VECTOR TO ROUTINE AT $C060
170 0017 801800  STA $0318
180 001A 8000   LDA #00
190 001C 801800  STA $0318
200 001F          ;ENABLE IRQ
210 001F 8001   LDA #01
220 0021 801A00  STA $001A
230 0024          ;RETURN TO BASIC
240 0024 00     CLI
250 0025 00     RTS

```

```

10 0000          ;LISTING 2
20 0000          ;INTERRUPT ROUTINE
30 0040          LDA  #C040
40 0040 8000   LDA #00
50 0042 800004  STA $0400
60 0045          ;INCREASE LDA VALUE IN 30
70 0045 804100  INC $0041
80 0048          ;INCREASE STA SCREEN LOCATION BY TWO BYTES
90 0048 804300  INC $0043
100 004B 804300  INC $0043
110 004E          ;RE-ENABLE VIC IRQ
120 004E 8001   LDA #01
130 0050 801500  STA $0015
140 0053          ;TEST FOR KEY PRESS
150 0053 403100  JTP $0031

```

```

10 0000 ;LISTEND 3
20 0000 ;RESTORE KEY ROUTINE
30 0000 JRS SC000
40 0000 40 PIA
50 0001 0A TPA
60 0002 40 PMA
70 0003 00 TPA
80 0004 00 PPA
90 0005 4000 LDA #000
100 0007 0000FF JSR #PT000
110 0008 00 PLA
120 0009 00 TAP
130 000C 00 PLA
140 000D 0A TAP
150 000E 00 PLA
160 000F 40 RTI

```

```

5 SYB10*1000
10 A=<A+1>AND 15
20 POKES3200,A
30 B=<B+.1>
40 IF B>15 THEN B=0
50 POKES3201,B AND 15
65 IF B>8 THEN 100
60 FORB=8 TO POKES3278,B NEXT
70 B=0; POKES3278,200
100 001010

```

```

0 REM SET INTERRUPT
1 DATA 100,100,0,141,13,200,141
,13,201,173,13,200,173,13,201,15
0,0
2 DATA 141,20,0,100,100,141,21,0
,141,25,0,100,00,141,24,0,100,1,
141
3 DATA 00,200,00,00,000
4 REM INTERRUPT
5 DATA 100,0,141,0,4,200,00,100,
200,07,100,200,07,100,100,1,141,
25
6 DATA 000,70,40,204,000
0 REM RESTORE ROUTINE
9 DATA 72,130,72,100,72,100,147,
30,210,200,104,100,104,170,104,0
4,000
10 A=10*4000:GOSUB000
20 A=10*4000+04:GOSUB000
30 A=10*4000+06:GOSUB000
40 END
200 READ:IFB<>00 THEN POKEA,B:0
+A+1:GOTO200
210 RETURN

```

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Adventure Kit III

*Continuing our adventure writing series, this month we
look at various objects.*

By Allen Webb

All adventures rely on objects, and this month I will look at the various uses they can be put to. They can be things you either pick up or use or they can be people or animals. All objects have basic features and exist at a fixed place, have a fixed size and generally have a fixed mass. These facts need to be stored in some way and manipulated. Let's have a look at one way of saving information and providing a set of routines to use it.

The code occupies \$C000-\$C2D0 and the area \$8000 to \$81FF allocated to object data. Each object has a record entry rather like conventional databases. Each record holds the following information:

1 byte specifying the object's location.
1 byte signifying whether the object is worn.

1 byte holding the weight of the object.
1 byte holding the length of the text describing the object.

The object description is ASCII.

It then follows that if the maximum description length is N, then each record will be N+4 bytes long. The system requires each record to be the same length so that a simple indexing system can be used. The maximum number of objects that can be stored is given by:

$256/(N+4)$

If you specify a name length of 16 characters, there is enough room for 100 objects. In my experience this is sufficient for most adventures. You must tell the code the maximum length of the object names. This is held at location #982. A length of 16 is assumed by default. You can change it either by POKING in the new value or using the SETUP routine in the code.

You must also tell the code how many objects are stored. This is held in location #48. You should remember that object 0 can be assigned to if you specify five objects, you can use objects 0 to 4 inclusive.

The code provides two commands:

ISHERE

SYNTAX: SYS SA,OBJNO,LOCNO

The routine checks to see whether the specified object is at the specified location. If it is present, the location #46 contains 255 otherwise it contains 0. The following example is useful when an object must be present to allow an action (e.g. EXAMINE, EAT, KILL).

```
1000 SYS SA,OBJNO:IF PEEK(#46)=0 THEN PRINT "IT'S NOT HERE":RETURN
```

Location 215 is used for carried objects so executing ISHERE with location 215 is useful to check if you are carrying something.

GETWT

SYNTAX: SYS SA+1,OBJNO

This routine extracts the weight of the specified object and returns it in location #47. Imagine that the weight carried out by you is in variable CW. The following code checks to see if you can TAKE an object, assuming that the maximum you can carry is 30 units.

```
1000 SYS SA+1:OBJ:IF PEEK(#47)+CW>30 THEN PRINT "THAT TOO HEAVY":RETURN
```

TAKE

SYNTAX: SYS SA+6,OBJNO

This routine changes the location of the object to 255 which then adds it to your carried possessions. First of all it calls ISHERE and checks if the object is present. If the object is absent it exits with location #46 set as for ISHERE. If the object is present it takes it. Here are two examples, the second uses GETWT:

```
1000 SYS SA+6:OBJ:IF PEEK(#46)=0 THEN PRINT "I CAN'T FIND IT":RETURN
0000 PRINT "TAKEN":RETURN
1005 SYS SA:OBJ:IF PEEK(#46)=0 THEN PRINT "I CAN'T FIND IT":RETURN
0000 SYS SA+3:OBJ:IF PEEK(#47)+CW>30 THEN PRINT "IT'S TOO HEAVY":RETURN
1020 SYS SA + 6:OBJ PRINT "TAKEN":CW=CW+PEEK(#47):RETURN
```

Since you want to check the weight of the object before taking it, ISHERE and GETWT were called first.

SETUP

SYNTAX: SYS SA+21,#OBJLEN, COL1,COL2,BORDER,SCREEN

This routine sets up the working parameters:

OBJ# number of objects
N1: object name length
COL1: normal text colour
COL2: highlight colour for inventory
BORDER: border colour
SCREEN: screen colour

DROP

SYNTAX: SYS SA+9,OBJNO,
LOCNO

This is the reverse of TAKE in that it sets the object's location to the current location having first checked that you have the object. DROP also automatically clears the worn flag. Here is an example:

```
1000 SYS SA+9,OBJNO, LOCNO: IF
PEEK(946)=0 THEN PRINT "YOU
DON'T HAVE IT": RETURN
1010 PRINT "DROPPED":
RETURN
```

If you are using weights, another example is:

```
1000 SYS SA+9,OBJNO: IF PEEK(946)=0
THEN PRINT "YOU DON'T HAVE
IT": RETURN
1000 SYS SA+1,OBJNO: CW=CW-
PEEK(947): PRINT "DROPPED":
RETURN
```

LOOK

SYNTAX: SYS SA+12,LOCNO,
PTYPE,ROW,COL

This routine prints the object present in the specified location. As in the first part of this series, there are two possible print formats:

WEAR

SYNTAX: SYS SA+18,OBJNO

This command sets the worn flag of the specified object. This allows you to specify that an object must be worn. For example, you need to wear gloves to pick up a hot object. WEAR checks to ensure that you have the object:

WEARING

SYNTAX: SYS SA+21,OBJNO

This routine checks to see if you are wearing the specified object and returns a value in location 946.

PEEK(946)=125 if you are not wearing it
PEEK(946)=0 if you are wearing it

The previous example can be extended to stop you trying to wear something already worn:

```
1000 SYS SA+18,OBJNO: IF PEEK(946)=0
THE PRINT "YOU DON'T HAVE
THAT": RETURN
1010 PRINT "YOU ARE NOW
WEARING IT": RETURN
```

```
1000 SYS SA+21,OBJNO: IF PEEK(946)=0
THEN PRINT "YOU'RE ALREADY
WEARING IT": RETURN
1010 SYS SA+18,OBJNO: IF PEEK(946)=0
THEN PRINT "YOU DON'T
HAVE THAT": RETURN
1020 PRINT "YOU ARE NOW
WEARING IT": RETURN
```

INVENTORY

SYNTAX: SYS SA+15,PTYPE,
ROW,COL

This command prints the objects carried. The same format options as for LOOK are provided. Any objects which are being worn are shown in a different colour to highlight them.

MOVEIT

SYNTAX: SYS SA+14, OBJNO,
LOCNO

This routine moves the specified object to the specified location. This is a general form of TAKE and DROP and allows more drastic actions such as manufacturing something or making objects appear and disappear.

As usual I have included a simple editor. The only real comment to make is that you must use the setup option before starting work since it initializes the number of objects and name length. The view option allows you to step through the object table. You press any key to step onto the next object. I have not included an option to allow you to change the record size halfway through creating your data base. Again work out everything on paper before starting typing.

To help your use of the routines, I have included a trivial demo. This assumes that you are at location 946 and ensures that you set up the objects at that location. The routine assumes four objects with a name length of 16. This routine is quite primitive and you will have to remember the numbers of the objects.



See listing on page 87

Diskit 8

Improve the efficiency of earlier programs in the Diskit series with this memory clear routine.

By Les Allan

It has become obvious from correspondence that readers who have used programs presented earlier in this series, have discovered that the effects of the Turbo-Cruncher were not as efficient as they should have been. The reason for this is that the clear memory not used by the program being crunched, is not empty.

Memory Clear, presented here, fills the C84s memory between \$0000 and \$FFFF with \$00, i.e. the program clears the computers RAM.

This will ensure maximum efficiency in compressing code to produce a compacted file when turbo crunched in conjunction with the Turbo-Cruncher program published in *Four Commodore* March 1987.

The program is simple to use and if you follow the instructions below you should have no problems crunching programs.

- 1) Load in MEM ALL CLEAR and RUN to fill memory between \$0001 and \$FFFF with \$00.
- 2) Load in the program that you wish to crunch.
- 3) Reset the computer if required.
- 4) LOAD "MEM1".JL (May 1987).
- 5) LOAD "MEM2".JL.
- 6) Type in the SYS call required, e.g. \$SYS 2061 (if that's the start address).
- 7) SYS \$28 to save memory.
- 8) The 2 files BOOT and MAIN are now a complete working copy of the

See listing on page 77

program which can then be crunched.

- 9) If when the MAIN part is crunched it crunches to less than 154 blocks then the KERN part can be appended to this using the ONE PART MAKER routine.

Getting it all in

The program is presented here as a Basic Loader. This should be typed in using the Syntax Checker that can be found on the Listings page. When RUN this program stores the relevant machine code at a temporary address of \$0000 and when prompted reboots the working program to Basic \$0001 and SAVES the program to disk.

77

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Moebius and the Orb of Celestial Harmony

Honourable Origin's inscrutable approach to the chopping and churning world of oriental quests.

By Norman Doyle



Here, on the once-prosperous, oriental paradise of Khantua, the plains of peace and prosperity of the Mandarins has been ported away with the disappearance of the Orb of Celestial Harmony. The mind of Moebius, the Master of Magic, also known as Windwalker, has been

clouded by the storms, droughts and earthquakes which now shatter the celestial serenity which was once the island's province.

The rising of the bamboo curtain separating the realms of Earth, Water, Air and Fire has diminished the Windwalker's power and now, evil forces now rule the domain. Evil monks, assassins and palace guards have lowered in on the wind of change, whipped into a galling gale by the self-styled Warlord of the East Wind.

Moebius, immobilised by the missing Orb, must mobilise a martial arts master to march against the malevolent masses. A novice must be found who can cross the boundaries between the realms, breaking havoc on the forces which bind the Orb to its new owner. Any takers?

For the first time, the rather crude but clever graphics which have been a hallmark of Origin games, such as the Ultima series, have been overhauled and a new level of realism has been injected. I admit that by current martial art standards the game lacks the fluidity of Fu and International Karate, but it is the strategy of the battle which is the central core of this conflict.

As a novice, the player must be trained to overcome the assassins and guards who police the new state. Only mastery in the three skills of unarmed combat, sword fighting and



divination will allow the character creation screen to include an entry to allow you to venture forth.

As a lowly acolyte of unproven prowess and no experience, you start the adventure with 100 sips of water, 100 bites of food, a low degree of mindpower and minimal strength. Alone in the realm of Earth, you must fight to free the monks of Moebius and restore them to their duties in the shrine.

Movement is difficult, as much of the land is overgrown and you must cut a swath with your sword to enable your character's form to wander across the symbolic map. As you journey, the palace guards will be called to the attack and assassins will attempt to crop up on you. Creatures of the forest will also maul you but they may also yield some precious ingredients for the spells which are essential to victory.

Other wanderers inhabit the forest. These are the villagers who will help a friendly traveler with gifts of food or advice. Approaching a peasant with your sword drawn will inhibit any communication and thereby damage your Karma.

Karma is measured by a split on a Zen symbol which is on

the screen all the time and gives a measure of your piety. Similarly, dexterity is measured by a pair of wings which gradually migrate towards each side of the screen as you are preyed upon by a thieving gnat, attacked by an animal, struck by an assassin's dagger or stung by an evil monk's forked.

Your progress is followed by Moebius' omnipotent gaze, and when he is pleased with your progress, he will increase your body and mind potential while returning your karma and dexterity to full unity. When exceptionally pleased, he may even bestow a spell upon you.

Using brain, brass and magic, the novice grows in manhood as he progresses from rains to rains until the final, fiery fury of the confrontation with the Warlord himself.

My one major complaint is the heavy use of the keyboard for issuing the single keypress commands. This is fine for opening doors and picking things up, but it does inhibit the fight scenes when you're groping for the correct key to kick, punch or whatever. The fight scenes could be potentially better but they're challenging enough to inhibit your progress which is their main purpose. At times the number of assaults make the feel like *Clayton* - the dancing battle appears insurmountable foes.

Moebius is a cut above most strategy games, allowing a degree of interaction which is, graphically superior to anything I've seen from the States. Perhaps the interchange of personnel and ideas which is currently taking place between Origin and Microprose's British and American units will benefit the arcade elements in strategy games. Certainly a touch of *Exploding Fist* would have given this unassailable universal appeal instead of just being a great strategy game.

Touchline:

Title: Moebius and the Orb of Colonial Harmony, Kuppelwe Origin Systems, Microprose, 2 Market Place, Fitchburg, Massachusetts 01334, Tel: 800-54536, Machines Cost: Prior £78.95 (plus) Originally \$70, Graphics: 3200 Playability: 3/10, Value: 3/10.

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The Your Commodore Software Service makes available all of the programs from each issue on both cassette and disk at a price of \$8.00 for disk and \$4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

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



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Disk Manager

Get organized with this handy disk utility program.

By M.E. Catley

Imagine this - a C64 where disk commands are just one or two key presses away. A Copy or Rename command that prompts you to input the old and new filenames, instead of having to remember "11 oldfile=newfile or newfile=oldfile". And a Format command that requests a disk name and i.d. And the ability to load a machine code program at any time without having to NEW the computer afterwards. A Scratch command that tells you automatically how many files have been scratched. The ability to validate or initialize the drive with automatic confirmation of success or failure. No, not the CDM DOS 5.1 program supplied by Commodore which only goes part way to providing these facilities.

Disk manager is a disk utility program that gives you all these facilities although there are a few drawbacks. Commands which are available include:

C - Copy File
 S - Save File
 R - Rename File
 F - Format Drive
 B - Boot Drive
 X - Exit Utility
 K - Kill Utility
 S - Scratch File
 V - Validate Disk
 L - Load File (L) → Load File (L,I)
 I - Initialize Disk

When the code is in memory, it is activated by SYS 53000. This will not appear to do much, but will divert the IRQ call that occurs 60 times per

second to point to our routine. The only effect this has is to check the keyboard for the CDM and control keys being pressed simultaneously. If they are not pressed, then the standard IRQ routine is carried out, and the computer functions normally.

If the CDM/control keys are pressed together, any program running is temporarily suspended. It will resume after exiting the utility, the screen and colour memory are stored under the BASIC ROM, and a window is opened on the screen displaying the commands available with an input/output line for commands, responses and errors. Now all the commands are just one key press away.

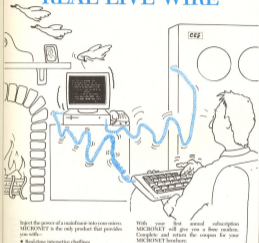
Follow the on-screen prompts and disk house-keeping becomes simplicity itself. X will exit the utility, while K will restore the IRQ vectors back to normal, in which case another SYS 53000 call will be required to re-activate the facility.

True to life, you get nothing for nothing, and there are a few minor restrictions. Your program must not use the memory under the BASIC ROM, or from 51500 to 55200 (BC9C-BCFF) and the utility assumes the normal character set at the screen default location of 1024 (B0400). The utility will not work with any graphic screen or mode.

See listing on page 78



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Relocator

Reload programs anywhere in memory with this handy utility program.

By William Sellers

The relocator is a utility for the serious programmer. It allows programs which have been saved to cassette or disk to be set to reload at any required memory location. Consequently, it allows a program to be loaded to any location - ignoring the start address given on the header. Saving to tape can also be protected so that the program cannot be reloaded at a different start address by ordinary Commodore routines, although obviously this utility copes with this sort of protection. All information on the tape header is displayed and the presence of a data file or a protected file is indicated.

The program is designed to help in the creating of auto-start programs that need to reload in the area of memory below \$B400 and for saving data that needs to reload underneath the KERNAL ROM at \$E000 to \$FFFF. These are fairly easy to do for disk users since program files can be written byte by byte as data fields but are not possible for cassette users with standard save routines.

How it works

The program works by calling the individual ROM routines involved in saving or loading a program instead of simply using the standard KERNAL routines. This allows custom headers to be created so that the reload address is under independent control. It also enables headers read in to be ignored completely so that new start addresses can be set.



Getting it in

The program is presented as a BASIC program which POKs the machine code program into memory from \$0800 to \$100C and then saves this chunk of memory to disk (tape users need to make the changes indicated in the listing) as the program 'RELOCATOR'. It is this second program that is used. For the BASIC program to run, it is necessary to initially move up the start of BASIC, so that there is room for the new program. This needs to be done before the program is typed in and is achieved by typing: POK\$43,POK\$44,52: POK\$19C, \$NEW

There is an error check on each line, but care should be taken to save a copy of the BASIC program before it is RUN.

The Program

Have the computer and load 'RELOCATOR' from tape or disk. When it has loaded, simply type 'RUN'. The program is completely menu-driven and is very simple to use. The available options are: tape load; protected tape save; unprotected tape save; disk load and disk save. For the load options you are prompted for a name (optional for tape) and a start address in hexadecimal. After the load, the old and new start and end addresses are displayed. For the Save options you are prompted for the start and end addresses of the area of memory that you require to save and the start address that you wish it to reload at. Again, after saving, the old and new start and end addresses are displayed.

See listing on page 85

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Tech Troubles

Don't suffer in silence. Let Tim Arnot help you out with your technical problems.

By Tim Arnot

Dear Tim,

This might sound like a strange enquiry, but we are hoping you will be able to solve one of our problems that we have come up against.

Could you tell me what is required to use a PET dual disk drive with a CBM 64. I understand that a couple of PORE commands may be required.

We are not in a position to use this setup until we have solved this problem. Mark Powell, Silverway College of Arts & Technology.

Hi Mark,

Connecting a PET dual disk drive to a Commodore 64 is not quite as straightforward as you think. There is an obvious difference in that the connector on the back of the 64 is a six pin din, and the connector on the disk drive is a 36 pin IEC socket. The main reason for this is that the PET used an IEEE-488 interface to talk to its peripherals, whereas the 64 has a proprietary serial bus. The "PET to IEEE" cable supplied with the drive looks like it might plug into the same port on the back of the 64, however, even though it fits, it will not work.

In 1982, when Commodore were designing the VIC-20 (the forerunner to the 64), they decided they needed to cut costs and use readily available cabling for the peripheral interface. This was prompted by the fact that the sole supplier of PET to IEEE cables had just won a large defence contract and couldn't supply for several months. So, a fast serial cable was

invented, that still used the IEEE protocol for software compatibility. Unfortunately, there were flaws in one of the major chips, and faced with the choice of Jack Tramiel's wrath or slowing the system down chronically, the engineers chose the latter option and whistled quietly.

After the history lesson, back to your problem! You will need to convert the serial bus format into a parallel IEEE format. There is no simple way to do this other than by buying a proprietary interface. The one I normally recommend is made by Brian Bevan (850-228 2500) and costs 664.95 + V.A.T. It plugs into the cartridge port of the 64 (or 128), but has a feed through connector so that cartridge, memory, modem, etc. can still be used.

Dear Tim,

Can you please help? I have just bought a Sans portable T.V. for my C64 & would like to know how to connect up the 33 pin SCART plug from the T.V. to the audio/video socket on my C64. In the user manual it shows a 2 pin socket, but on my C64 it has an 8 pin socket, could you please give the appropriate connections from the SCART plug to the audio/video socket.

Steve Norman, Shepton Mallet.

Hi Steve,

The original Commodore 64 was shipped with a 5 pin A/V socket, but

later ones have the 8 pin socket. The pinout for the 8 pin version is as follows:

- 1 - Luminance/Sync
- 2 - Ground
- 3 - Audio Out
- 4 - Composite Video
- 5 - Audio In
- 6 - Chroma
- 7 - N/C
- 8 - N/C

The pinout for the SCART socket is as follows:

- 1 - N/C
- 2 - Audio L/P
- 3 - N/C
- 4 - Audio GND
- 5 - Blue GND
- 6 - Audio L/P
- 7 - Blue
- 8 - N/C
- 9 - Green GND
- 10 - N/C
- 11 - Green
- 12 - N/C
- 13 - Red GND
- 14 - N/C
- 15 - Red
- 16 - Fast Blank
- 17 - PAL GND
- 18 - Fast Blank
- 19 - N/C
- 20 - PAL
- 21 - Sync

The simplest way to connect the two together is to join all the ground connections on the SCART plug together and take them to the ground

on the 4 pin DIN. Then connect the Composite output to the PAL input (pin 20) and the audio output to both of the audio inputs. The other connections are for an analogue RGB output, as produced by the Araya.

Dear Tim,

Computer: Commodore 64 (oldish).

Dot: Commodore 124C.

Printer: OMT Microline with Super Speed RS-232C board.

Interface: Intercept.

If I could get the advice as to how to connect I could have printed this letter, but then I wouldn't have needed to read it!

I have wired up the interface cable (printer/Intercept) using the following connections, but nothing happens when I divert output to the printer as instructed on page five of Intercept.

Printer

1 Ground
2 RS
20 RTS

Intercept

Ground 1
To Data 2

RTS 4
CTS 5
DCD 8
DTR 20
RY 22

As you can see, this is using Ready/Busy protocol, which is acceptable to the printer.

I also have an Interfacer, but that I really know how to use! When I connected it in line between the printer and intercept the DTR light (on the Interfacer) came on when the Intercept powered up. Does this mean that I'm nearly there?

I have included copies of as much documentation as I think might be helpful and I really would appreciate any help or recommendations you can give me.

Kathie Foster, Greenhead

P.S. I thought the article on disk drives and the RS-232C interface excellent reading. Please let's have more along similar lines.

Hi, Keith,

Thanks for your comments on the magazine. I am sure the editors are duly chuffed.

Connecting two RS-232 devices is always a difficult and traumatic task. I don't think I have ever come across an RS-232 system that worked first time around. The connections you have made should work in theory, and the fact that the printer is sending DTR positive indicates that it is waiting for data.

The first thing you want to check is that you have the printer dip switches set correctly, i.e. SW1-4 is on, and both SW1-7 and SW1-8 are on. This selects the ready/busy protocol and uses DTR for busy control. Also check your wiring is really as you think it is.

Assuming all that to be OK, it could be that the Intercept is interrupting the CTS high as busy. You can easily check this by using SMD from the printer for busy and inverting switches 7 and 8.

Being remote from the situation, that's really about all I can suggest. However I'll leave you with the thought that if you know what you're doing, there's a lot of money to be made in the consultancy business - setting up people's RS-232 parts.

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Eight Speed Scroller

Learn the art of smooth scrolling with this handy program.

By Richard Ikin

The routine I have presented here is a hardware scroll routine for the Commodore 64. It is an 8 speed, 8 directional scroll routine. The two speeds (horizontal and vertical) are set at 1 pixel, however these can be altered by changing XSPEED or YSPEED in the assembly language program or by breaking out of the program (after running the basic loader) by using HUNSTOP/RESTORE and poking the two locations shown below.

The routine works by altering the hardware scroll registers whenever the joystick is used and changing a pointer to the top left of the screen in memory when needed. The screen contents are not moved by a soft ware scroll routine but the screen is taken from the map and printed onto the video matrix.

The routine is a very smooth hardware scroll routine. I use this routine myself in my own games so I know it works.

Use a joystick in port 2 to scroll the screen. None of the ROMs are switched out, therefore you may notice them on screen as you will all 64K (in BK sections) printed on screen and ROMs switched out to eliminate this.

The scroll moves in the opposite direction to the way the joystick is moved, as it would in a game, i.e. to scroll left, move the joystick right.

The routine presented here is not really a complete program for you to use. What it does do is illustrate how you would produce such a routine for your own programs.

The Program

The eight speed scroller is presented both as a basic program in the form of a series of data statements, and as an assembly listing.

As you can see from the assembly listing, the first task is to set the raster interrupt. This is what the 'series' routine does. It also switches the Vic chip to look at memory locations 05384 to 52767 instead of the default 0016380.

You may notice that the program does not switch out any of the ROMs. The Basic ROM can be switched out by clearing bit 4 of location 0001. However, if you do this you must change the RTS in line 998 to an endless loop, as the RTS will cause a return to Basic and as you have just switched Basic out this will cause nasty problems.

OK, whenever a raster interrupt is generated, the 64 will divert its attention to the interrupt routine. The first thing that should be done when the routine is entered is to check the direction of the scroll. This is held in the variable 'way'. If you look at lines 6158 to 6174 in the assembly listing you will see what values need to be in 'way' to cause scrolling. As you can see, a zero will cause all scrolling.

When the direction has been decided and appropriate action taken, the raster spin is processed. The comments in the assembly listing explain what action is taken.

Lines 1741 to 2628 are the four routines that perform the actual hardware scrolling of the Commodore screen. These are the routines that provide the smooth part of 'Smooth Scrolling'.

As you may know, the Vic II chip can alter the horizontal and vertical position of the screen with up to eight vertical and eight horizontal positions. Therefore to achieve smooth scrolling we must:

- a) alter the scroll register until it reaches its maximum or minimum value.
- b) when this point is reached we must change the address of screen (2) in the map.

As every second interrupt the contents of screen (2) are displayed on screen (1). If you look at the 'window' routine you will see that the section of memory/addressed by the 16-bit value 'map' is loaded into the video matrix at 15408.

The contents of 'map' is the address on the top left corner of screen (2) in the map. Screen (2) is an exact replica of the screen you see when you look at your TV. All it does is point to the data which is displayed on screen.

As the routine will scroll through the whole 64K of the Commodore's memory you will at times no doubt see some pretty weird data printed up on the screen. This is because none of the ROMs are switched out and what is being printed up is the ROMs working storage areas being displayed on the screen. When you set a limit to the size of the scrolling area and switch the Basic ROM out, none of this occurs.

The control routine is a fairly standard routine and can be replaced by your own, as long as you state the correct values in 'way'.

The speed of scroll is set by the value in 'Xspeed' and 'Yspeed'. The value should not be less than one and not more than seven. They are independent of each other.

In the future I will add a routine to set the size of the scrolling, and will also present any further alterations that I make. I would be interested to see anybody else's ideas.

See listing on page 99

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☐ What does Deep Scan Nibbler do? Deep Scan Nibbler is a portable system which is used to recover the data from a hard disk drive or floppy disk - when you start the Deep Scan Nibbler, it will scan the hard disk drive and find all the data that is on the disk drive and copy it to a portable system

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How to Enter

On this competition page you will find a photograph of some football action.

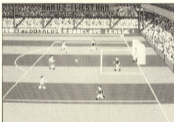
In the time honoured tradition the ball has been erased from the picture and it is up to you to point out where the ball is.

Study the picture carefully and mark with an X the position where you think the ball is.

Then complete the entry form and return it together with the picture to the Four Commodore editorial address. Closing date for the competition is December 31st 1987.

The Rules

Entries will not be accepted from employees of Argus Specialist Publications and Addictive Games. This restriction also applies to employees' families and agents of the companies. The How to Enter section forms part of the rules. The Editor's decision is final and no correspondence will be entered into.



Football Manager II Competition

Entry Coupon

Name

Address

Postcode

Post to: Your Commodore, Football Manager II Competition, 1 Golden Square, London W1R 3AB. Closing date: 31st December 1987.

Typro

Give your Plus/4 powerful typing and wordprocessing facilities.

By P.G. Simonds

The inbuilt wordprocessing of the Plus/4 is great for producing small notes or documents. However, when it comes to planning out large documents or tables it isn't really of much use.

Typro for the Plus/4 gives your computer advanced typewriting and wordprocessing facilities. The following is a list of some of the main functions that are offered by the program.

Each line is printed as you compose your document, either on a dot matrix printer or on a daisy wheel.

Line length can be set up to 164 characters; this is done when using the Commodore DPS 1801 daisy wheel, with end of line audible warning.

Characters can be printed in either cursor up, uppercase and graphics, or cursor down, upper and lower case, modes. Reverse can be used as well as normal text; facilities are also present to allow use of expanded characters if using a dot matrix printer.

If you are using the DPS 1801 daisy wheel printer you can access the double strike and underline modes.

Documents of up to 200 lines can be entered, subject to line length. With a document of 100 lines, line length, the full 200 text lines are available for use. The amount of memory left is shown in the single line menu mode.

Text and graphics (bit image) modes are available for normal or non-spacing between lines on a dot matrix printer.

Widgets saving modes include the ability to insert or delete lines, copy lines to another part of the document, review and edit modes as well as file saving and documents merging modes together with full or part document printing facilities.

One major plus for Typro is that the whole program is written in Basic. This means that the program can easily be modified to work with cassette or to work with other printers. It may even be possible, with a little work, to make the program run on a C64.

Rather than simply giving a description of how to use the program, a detailed breakdown of the program is given, this should enable people with a little programming knowledge to alter it to suit their own requirements.

Initialisation

(1800 - 1870 and 2000 - 2009)

This section of the program initialises all of the variables required by the program - screen colours are also set here. This section of the program allows entry to typing mode (main page), loading of a disk file (old page) or to the full page menu.

Entry is made to this routine every time you RUN the program or the Commodore key and X are pressed in menu mode.

If a new page is started this routine will set the line length. A typing grid is also set up to assist with the planning of text layout. This mode also checks to see if the printer (device number 4) is switched on.

Typing (new page)

(1000 - 1080 and 3000 - 3120)

This routine assembles and then prints each new line as it is added to the bottom of the page in memory.

Entry to this mode is made by pressing 'C' from the main menu or after printing the previous line.

When this routine is entered for the first time the document width will be set. The new line will automatically be

printed when it is full or if terminated early by pressing CLEAR/HOME.

After printing a new line, you must press either 'M' to enter main mode or 'C' to enter a new line. Any other response will generate an audible tone.

Inverted commas can be used in the text. However, it is worth pointing out that some printers produce a control code at the end of a line that has an odd number of inverted commas on a line.

The following keys are used in this mode:

CLEAR/HOME - terminates a line and prints it.

ESC - Returns program to menu listing any text.

CURSOR LEFT - deletes a character.

CURSOR RIGHT - acts as space key.

Pressing CONTROL, with one of the colour keys gives access to facilities such as underline, etc. Figure 1 gives details of all of these. You can see control codes at a glance since they are displayed as flashing, reverse field black numbers.

If you turn underline on or reverse field the text will be reversed on the screen.

Menu Mode

(4000 - 4299)

This is where you can select which part of the program that you want to go to. Entry to this section of the program is usually made by pressing M in either options. Entry can also be made by errors or tasks completing their operation. While in this mode the single line menu will display the memory available. The full screen menu can be entered by pressing 'M' while in single line mode. The text currently in memory can be deleted by pressing the Commodore key and 'X' at the same time.

Single Width or Strike	Double Width Or Strike	Line Spacing	Graphic Spacing	Reverse Or Underline On	Reverse Or Underline Off	Upper Case & Graphic	Lower Case & Capital
A-24	A-24	B-16	B-8	C-16	C-16H	D-16H	D-17
Control J	Control E	Control D	Control 4	Control R	Control G	Control 7	Control 8

Edit Mode

(2000 - 2500)

This section of the program allows you to alter a line of text that already exists within the program. Entry to this section is made by pressing 'E' while in the menu or review mode.

If you try to edit a line that does not exist you will return to the menu. Exit from this routine can also be made by pressing ESC as long as the text and control codes are unchanged.

When you enter this mode the existing text will be printed to the screen, together with a blank typing grid to allow you to retype the line. Should you only want to change the start and end of line control codes you can change them and then press the ESC key to use the old text with the new codes.

If the text or embedded control codes are to be changed the whole line must be rewritten. While typing an audible tone starts as you reach ten characters from the end of the line.

As with normal editing mode cursor left deletes a character, cursor right acts as space and clear/home terminates line entry. When editing a line the same routine is used as for line entry at 1850 - 1870 and the same control code display and delete routines at lines 1455 - 1468 and 1685 - 1698 are also used.

Printing

(2000 - 2110)

Entry to this section of the program allows you to print out the whole of the document or just a small part of it. Entry is made to this routine when you press 'P' while in the menu mode.

When in printing mode you can print the full document by pressing 'P' or simply part of it by pressing 'F'. Should you want to return to the menu you can do this by pressing 'M'.

Should you want to print a single line you can do this by making both the start and end lines for a partial print the same. Return to the menu menu if the start of printing lines does not exist or if the end of printing is zero or less than the starting line.

Save File

(2000 - 2200 and 3000 - 3130)

Entry to this section of the program allows you to save the document that you have entered to disk. Entry to the save mode is made by pressing 'S' when in the menu mode.

Should you enter save mode by mistake the 'N' key or entering a file name 'M' will return you to the main menu. The names of the files on disk can be indexed using a file name of 'F'.

Should you give a file the same

name as one that already exists on the disk, the new file will overwrite the old one. When you save a document the page length, page width and comment/colon usage flag variables N, W and S1 are also saved.

Each line of the document is saved in two parts. This is because control of strings greater than 84 characters in length form disk or tape which can cause problems. Saving strings that include comment and colon causes problems, these are therefore substituted and translated before saving. Formatting of the strings so that they are ready for filing is done by the subroutine at lines 3000 - 3130. When a file is saved confirmation will be required if you have used comment or colons. A response of 'N' will save translation time when the file is read, however don't type 'M' if you want to use comment in this file.

Load file

(3000 - 3200)

This section of the program loads a disk file into memory, erasing any text already in memory. Entry to this section of the program is made by pressing 'L' when in menu mode.

Facilities to exit this routine and list files on the disk are the same as for

F I L E M E N U	
A	ADD OR DELETE LINES.
C	CONTINUE NEXT LINE OF PAGE.
D	COPY LINE(S) OVER OTHER LINE(S).
E	EDIT AN EXISTING LINE.
H	FULL MENU ON SCREEN.
I	INDEX OF FILES ON DISK.
L	LOAD FILE FROM DISK DRIVE.
M	MERGE FILE ON DISK WITH MEMORY.
P	PRINT FULL OR PART COPY OF PAGE.
R	REVIEW PAGE FROM LINE ONE.
S	SAVE FILE TO DISK DRIVE.
COMM + X	ERASE PAGE & NEW START.

saving files. If the variable \$, read from the text file, is set to 1 the file contains commas and colons. These will be translated after a file is loaded. This does increase loading time.

Review Document

(10000 - 10190)

This part of the program displays each line of the document with its embedded control codes and the end of line control codes. Entry to this section is made by pressing 'R' from the main menu.

While in review mode the cursor up and down keys are used to move up and down in the document. Should you want to move a little quicker the cursor left and cursor right keys move you ten lines up and down. If a line is to be changed you can go straight to edit mode by pressing 'E'. The menu is accessed as normal by pressing 'M'.

The four control codes shown below each line of text show the printer control codes at the start of the line. Embedded control codes show how the printing control changes, and where, along a line of text or graphics.

If the text is to appear underlined or overline on the printer it will be reversed out on the screen.

The screen switches between graphics modes and text mode as required by the text, should you want to check text yourself then you can change mode by pressing Commodore and shift at the same time.

Add or Delete

(11000 - 12100)

It is possible to add lines or delete lines in the middle of an existing document. Pressing 'A' while in the main menu will bring you to this mode.

Should you enter this section of the program by mistake, pressing 'M', adding 0 lines or adding too many lines will all return you to the menu.

You can add lines in either text or graphics mode. When you insert a line the line will be empty, enter the edit or copy modes to add text in its space.

You can delete any number of lines from the document. Lines are erased and existing lines are closed up to make the document smaller.

Copying Lines

(12000 - 13200)

This function allows you to copy lines from one part of the document to another. If lines are copied beyond the length of the document, any unused lines between the original document are added as empty text lines with normal spacing.

Merging Documents

(14000 - 14200)

Entry to this section of the program allows you to insert a document that is filed on disk onto the end of the document that is in memory.

The width of the existing document will be increased if the file being merged is wider than the one in memory.

That's all there is to it! The breakdown of the program should enable you to alter the program should you need it. You should soon be producing extremely neat, well laid out documents.

See listing on page 79

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Games Reviews

A look at what's new on the games front.

RENEGADE

The streets aren't safe but you must cross town to collect your girl. You take the subway without any trouble, so far, so good, but when you get off the train you're met by a gang of thugs and one is wielding a crowbar.

You move around the screen using standard joystick controls and deliver your blow by pressing one of the attack keys. These keys are J to jump (and kick if a thug's in range), and Z and left arrow to attack forwards and



backwards. You press the key and the CPU decides whether you're punching or kicking.

Unfortunately, these keys are at the top of the keyboard and therefore somewhere near your joystick so you're either going to have to practice a lot, buy a joystick that you can stick to the table or enter a friend to move you as you deliver the killing blow.

If you manage to survive the subway you then face peril on the pier as you battle with a gang of bikers who you must dislodge from their bikes before you can beat them into a pulp. Wipe them out and you have to face Big Bad Bertha and her whip-wielding female marauders, then a scrap in Bond Street with thugs armed with rioters that will floor you with a single blow before a final battle inside to finish off the gang who also have a gun!

At each level you have to smash the head of rioters

before the boss appears. Beat the boss and progress to the next screen. Complete them all and you have a few moments before you start the whole game again, only this time the gangs are even nastier.

Renegade adds a new lease of life for the tired and tested beat 'em up game with variety of opponents and some good backdrops. **T.H.**

Features:

Title: *Renegade*. **Supplier:** *Imaginix & Central Street, Manchester M12 1NS, Tel: 061-8570655. Machines:* C64. **Price:** £8.95 (C64) £12.95 (Disk).

Originality: 4/10. **Playability:** 3/10. **Graphics:** 5/10. **Value:** 7/10.

HYSTERIA

Wow, what a brilliant game - they were my first words when I saw *Hysteria*.

You are aware that someone or something is changing the past and shaping the future. Millions of light years away, these evil deities are playing with the fabric of time.



And being a real hard guy you decide to try and discover the demons and kill them. While you are waiting for them to show their ugly heads, you suddenly get caught up in a time warp and find yourself in ancient Greece, surrounded by ruined temples. There are also boats (no - not Star Fleet) that spit at you, and if you shoot these, either a piece of puzzle or a demon (?) will be revealed which can be picked up to select a weapon.

The weapons come in many forms. You start the game with laser eyes, but it is quite a weak weapon. However, the next one is the more powerful laser arrows which can be used to blow away enemies, and finally you have the protective dog, which isn't really a dog but a white dot (I can see the resemblance) that hovers around killing any monster that strays into its path. For those tight spots a jet pack always comes in handy, and as a prize four lenses this is good while it lasts.

Last but not least there is the wonder weapon, and as a modest few lenses this little baby will bring a load of spinning death orbs all around you, killing all enemies.

This game is first class - not coded, nice graphics and very playable. It's a shame that there are only three levels though, oh well you can't have it all. **K.L.**

Touchline:

Title: *Myxoria*. **Supplier:** Software Projects, Acornland Complex, Alton Road, Walsley, Liverpool L24 7SE. Tel: 051-428 9283. **Price:** £8.95 (Cass) £12.95 (Disk). **Machine:** C64. **Graphics:** 8/10. **Playability:** 8/10. **Originality:** 10/10. **Value:** 6/10.



WATER HOLD

Conspicuous. Given its Graphics, they've managed to find a sport that hasn't been done before! Now thanks to Gaudin's extensive research you can sample the excitement and end-to-end action as you take the plunge into Water Hold.

The six swimmers either side start at either end of the pool in a race for the ball. Whoever gets it can then swim with it or pass it hopefully to another player or try a shot at goal. Naturally the other side (either human or computer controlled) try to get the ball off you by tackling you from the front as you swim with the ball or by intercepting one of your passes. If you try and tackle from

behind, the poolside referee will get very excited and award a foul. One of these fouls are awarded for each player and when one collects three fouls that player is sent off for about two minutes but returns before that if the opposition scores a goal.

When you manage to score, the game shows you an action replay so you can either bask in glory or suffer a replay of an awful mistake.

The game is actually quite good and is full of end to end action and is ideal for those who want to perfect their tactics before they head for the swimming pools of Ironbrom T.M.

Touchline:

Title: *Water Polo*. **Supplier:** Gaudin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4SE. Tel: 01753 358 3377. **Machine:** C 64. **Price:** £8.99 (Cass) £14.99 (Disk). **Originality:** 10/10. **Playability:** 10/10. **Graphics:** 10/10. **Value:** 6/10.



MEGA APOCALYPSE

Well, on the tail of that groovy game Crazy Cosmos is the follow up in the shape of Mega Apocalypse. But is it as groovy? Yes, it's not stuff, as you play the part of a space ace, equipped with a saucer-shaped space craft.

Your mission is to boldly go where no man has been before, seek out new and warring worlds and then blow them to bits. That sounds fair to me as most of the inhabitants are stupid creatures such as winks.

The winks do not make easy prey however, and the planets they occupy have a will of their own and attack you with surprising force.

In between blasting planets you discover aliens that turn out to be quite useful, as you can acquire goodies such as speed-up and restore missiles and shields.

Mega Apocalypse also boasts a two-player option; you can play as friends or enemies, blasting each other as well as the hostile planets, trying to collect the goodies. I discovered a good technique to get hold of the extras, was a shell kick to your opponent's head - ask my brother!

Well, plenty of blasting, dodging and collecting, but is it worth the asking price? Hmmmmmmmm, it's good, but I feel a could soon become boring doing the same thing all the time.

And those of you who already have Crazy Cosmos, will

see the similarities in Mega Apocalypse, except of course for the superb space and improved graphics. **E.E.**

Touchline:

Title: *Mega Apocalypse*. **Supplier:** Masterdisk, Maxwell House, Ben Serrano, Perovany Art, Euro Simco. **BM24000.** **Price:** £8.95 (C/D) £12.95 (Disk). **Tel:** 0423 398635. **Machine:** C84. **Graphics:** 8/10. **Originality:** 5/10. **Playability:** 7/10. **Value:** 5/10.



RED L.E.D.

When obscure planets were mined, huge quantities of rare materials were discovered, rendering minerals such as gold and diamonds valueless. Instead, marble became the most prized substance as it was only found on the trickiest of surfaces.

This in turn became worthless as all trade was abolished. Instead, the huge mining companies were developed into places of entertainment.

Despite the usual inane storyline, Red L.E.D. is an excellent game. Very obviously derived from Spindizzy via Marble Madness, the object is to complete a path across a grid. You have three kinds of differing abilities and must solve both the dead end and the sector you wish to enter.

Each sector consists of a large scrolling terrain of walls, drops, acid lakes and the like. Four goals must be collected within a time limit in order to activate the exit. Enemy droids patrol the area and collisions with these or falling off the superstructure results in time penalties. Droid generators can be blasted, but then the rest of the droids turn particularly nasty and come gunning for you.

One of the droids can float harmlessly over the acid lakes. Others have to activate special switches in order to temporarily freeze them. Other areas can only be accessed via teleporters. You can improve your time allowance by walking into a time-dragon capsule – but make sure that it is spinning the right way.

Controlling your droid takes some getting used to due to the built-in inertial system. One of your droid functions, gravity, much better than the others so it obviously makes sense to use him on the extra-hilly sections. There is a bonus game to access and extra men, should you do particularly well.

Not only does this game look extremely impressive, but the gameplay matches the graphics and the result is infinitely more playable than either of its ancestors. Very highly recommended. **G.R.H.**

Touchline:

Title: *Red L.E.D.* **Supplier:** Starlight, 40 Long Arch, Green Garden, London, WC2E 9AM. **Tel:** 01-838 3411. **Machine:** C84. **Price:** £9.99 (C/D) £11.99 (disk). **Originality:** 5/10. **Graphics:** 8/10. **Playability:** 8/10. **Value:** 9/10.

RAPID FIRE

The latest game from Mastertronic is a little on the gory side. You play a Rambo-type character on a mission to raid a top security warehouse, leading into the warehouse is no hard task but progressing to the fifth level sure is.

The levels are guarded by all kinds of various buddies such as armed henchmen, flying grenades and balls of fire, all of which have to be dodged or shot. The progress onto the next level you will have to shoot a huge computer terminal where it hurts – in its involving red sphere (whichever that is). If you are successful, a hole in the floor will open and you will fall through to the next level.

If by a freak or pure luck you manage to get to the fifth level you will have to confront a master computer (no, not an Amiga) and if you can destroy this you have won the game.

This game has no stunning scenery, no groovy Rob J. J. beat music and the graphics are spotty average – another dull game? Not on your nether side. It is really addictive and quite frustrating and for a humble two quid you can't go wrong. Buy this game or your arms will fall off – need I say more?

Touchline:

Title: *Rapid Fire*. **Supplier:** Mastertronic, 8-10 Paul Street, London EC2A 4DE. **Tel:** 01-377 6880. **Price:** £1.99. **Machine:** C84. **Graphics:** 3/10. **Originality:** 2/10. **Playability:** 6/10. **Value:** 0/10.





PITFALL I & 2

Remember the good old days, when the WCS's from Atari were all the rage? You do? Good, then you will also remember those fab games in Pitfall I & 2. Well, Pitfall had been re-bought the rights and re-released them.

In both of the games, you play the part of Harry, the intrepid hero who is on a search of lost and valuable treasure. In Pitfall I you find yourself in a jungle full of traps, where there are gold bars lying around which you find hard to resist (understandably!). The gold however is not easy to get at as it is guarded by crocs with snapping jaws that need to be jumped over, huge holes that open and close, and voids that have to be swung across by a vine which requires perfect timing.

At the beginning of the game you are given 2000 points and these will decrease everytime you fall down a hole or die. Scorpions are also a hindrance as these bite in on you and are quite hard to avoid. Pitfall I is quite a playable game, but a bit basic. Another point, this game was converted from a 16K machine, "no what" I hear you say. Well, it has been copied almost exactly, the Commodore has 64K, wouldn't it have been better if they looked to improve it?

There I rest my case; if you haven't got it have a little look at it, you might like it.

Next comes the sequel in Pitfall 2. This is quite a good game going by its age.

Again you play Harry the explorer, but this time it's not just the gold you're after, it's your friends, who have got themselves lost in a huge underground labyrinth, you must also seek out the legendary cure rat and capture him. This will also boost up your money.

When you start off, you are in what looks like a jungle (Pitfall I) but as you make your way across the screen you will discover passages which have to be jumped down to reach the underground area which is unfortunately inhabited by electric eels.

An annoying feature of this game is the lack of a death system, which seems to be replaced by a number of red crosses scattered about the playing area, and if touched by any creature you will be transported back to the last cross you touched. Sometimes this can take quite a while and is always frustrating.

The music in the game is not bad. The graphics are nothing special but I highly recommend this game if you do

not have either of them. In their era these games were wonderful, but now at £3.99 they still represent good value.
K.R.

Touchline

Title: Pitfall I & 2, Scorpion Frontier, Fire Floor, 64-63 New England Service, London, WPC14 LP5, Tel: 01-378-6733, Price: £3.99 each. Machine: C64.

Title: Pitfall I

Graphics: 3/10 Originality: 8/10 Playability: 8/10 Value: 3/10.

Title: Pitfall 2

Graphics: 3/10 Originality: 8/10 Playability: 8/10 Value: 3/10.

DRUID II

It's been 103 years since Hiramax the Druid wiped out the evil being Anaximander, but somehow he has returned. It was a cool summer's day in the forest of Argoth, the sun shone brightly as a warm breeze filtered through the trees, rustling their leaves. Hiramax walked down the beaten path looking for some mistletoe which he needed for a new spell - Zapper.

As he walked along, squinting to keep the blinding sun out of his squinting eyes he noticed a bush in full bloom ahead. Suddenly, from out of the bush, came a solid bear with a look of intent on his face. Before the old Druid could react the bear was upon him and attacking his leg. Hiramax swiftly pointed a finger at the creature, chanted two mystic words and an electric bolt hit the bear between the eyes, and the bear fell off screaming with pain. As the Druid tended his wound with a 'heal spell' he thinks back to the strange



occurrence that has just taken place, and wonders "what could have gotten that bear in such a state?"

He gazed for a while - he could sense more in the woods, but there was something else, something weird.

A huge clap of thunder broke the eerie silence, and the sky grew dark. Hiramax's senses were tingling - he could smell something disgusting, the smell of ... death. From out of the bushes came scents of humans, dead humans - the living dead. One single thought entered the Druid's head, "Anaximander." He searched frantically in the cotton bag that held all his belongings and pulled out a silver cross, holding it high and causing the numbers to back off.

into the trees and bushes. Hastings then begins his long walk back to the village...

Well, that's roughly the story line for *David II* and now we move onto the game.

You start off in the village and come under constant attack from zombies and skeletons. You will also find various spells lying around which can be picked up and used. There are 32 spells and four elementary servants, which is a lot more than *David I*. The graphics have been improved and the game is much more playable than the first.

So there you have it, if you liked *David* and want some more of the same, get *David II*, you will not be sorry.

K.R.

Features:

Title: *David II*. **Supplier:** *Firebird Software*, First Floor, 64-67 New Oxford Street, London WC1A 1PS. Tel: 01-378 4715. **Machine:** C64. **Price:** £6.99.

Graphics: 8/10. **Playability:** 8/10. **Originality:** 5/10. **Value:** 9/10.



BISMARCK

In May 1941 the entire British home fleet (reinforced by ships urgently needed to protect convoys) were involved in an amazing search and kill operation designed to find and sink the *Bismarck*!

The *Bismarck* was the biggest battle ship the world had seen and was ready to hunt and kill in the shipping lanes. It was to be paired with the *Craizer*, Prince Eugen and eight of the British warships while the *Prince Eugen* destroyed the convoys.

The Admiralty sent out the order, "sink the *Bismarck*!".

You can play either the British or German commander in this deadly game of hide and seek. The German player starts North of Iceland and must escape, relatively undamaged, off the bottom of the screen and into the open sea. The British player must stop him.

Both players can get regular weather forecasts, intelligence reports and can fly reconnaissance missions (if the weather isn't too bad) that will help them find the enemy and attack or avoid. The British player controls six of 12 ships (the others are controlled by the Admiralty) the German only has two (the *Bismarck* and the *Prince Eugen*). It's going to be a close fight.

Whenever ships meet they can engage in battle which is fought in an arcade sequence in which you must select icons to control the ships speed to chase, retreat or maintain the same distance between you and the enemy. Second aim your guns and man the damage control systems to put out any fires.

Some British ships also have torpedo tubes and the Aircraft carrier *Victorious* can attack with Swordfish aircraft.

The British player cannot hope to sink the *Bismarck* in one fight and so must use its lesser ships to inflict as much damage as possible so the *Bismarck* has a chance to sink it.

Bismarck is an excellent game based on one of the most decisive battles of the war. If the *Bismarck* had escaped...

T.H.

Features:

Title: *Bismarck*. **Supplier:** JSS, 452 Stony Stanton Road, Coventry CV8 1DA. Tel: 0203 667558. **Machine:** C64. **Price:** £9.95 (C64 £14.95 (Dial)).

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

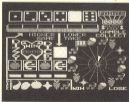
DIZZY DICE

Now here's something original - a fruit machine game! I thought they had died out with the ark. Although after playing this, it might have been better if they had.

To be sure, the game itself is very slick and looks good on screen even if you are not sure what is happening. There are four reels, and winning combinations pay out when they read either from left to right or vice versa. Reels can be held when the appropriate lights flash.

Should you manage to light a sequence of six fruits, you get to take part in a dice game, in which you must guess whether the next roll is going to be higher, lower or the same as the previous one. Getting into the dice game requires you to lose an awful lot of games on the trot as a winning combination, e.g. one cherry needs the fruit sequence.

When you get a winning combination, you can gamble your non-existent money although my strong recommendation is to not bother - the odds you get are



terrible. You must select the optimal a spinner is going to stop at. If you choose the bar, the odds against it coming up are fifteen to one against. The machine pays you six to one.

Computer fruit machine games fall into the same category as decaffeinated coffee or alcohol free beer. Why bother? The whole idea behind gambling is the risk that you might lose, coupled with the possibility of a big win. Playing with non-existent money defeats the whole object of the exercise. **G.R.H.**

Finalizer:

Title: Dazz Dice. **Supplier:** Players 2 (Mingus House, Calton Park, Aberdeen, Scots KY7 4QR). **Tel:** (07158) 71288. **Price:** £1.98.

Originality: 3/10. **Graphics:** 5/10. **Playability:** 2/10. **Value:** 2/10.



SOLOMON'S KEY

Who needs parallel worlds, ultra-fast 3D solid graphics and super-heroic, mega groovy music to make a decent game? Well, most people seem to, except U.S. Gold who have created a highly playable game which a few of you may remember. It goes by the name of Solomon's Key, which was fab in the arcades.

The story line is concise. You play a treasure seeker (aren't we all?) and on entering Solomon's mines. You must search through the levels avoiding all the deadly perils. Your main goal is to reach the key on each level and make haste towards the door. Each door you go through will bring you closer to your ultimate goal - Solomon's treasure room.

At the end of the third level you go into a bonus room, where you are instructed to cast a spell on the key. However, it is unclear what this actually means and the instructions give away no clues, I'm afraid.

The rooms are littered with objects, but there are too many to mention them all. The main ones are flames which can be used to fry the little monsters that wander around the scenes. Your other option is to pull a block away from under the monster's feet and watch him fall to his death (yeah!).

There are also lots of little balls around, which when touched, summon a fairy which you can use for dinner. Eat ten of these and you will get an extra man, plus indignation.

Your only real help is a magic wand, which for some strange reason makes mud bricks appear and disappear.

These are necessary to build stepping stones to the exit or to trap monsters (similar to the game Pengo, except you don't push the blocks).

I have been playing this game for hours (that's interesting to hear ED) and I'll take it home tonight and play it for hours (you've got work to do ED).

Well, what else I say, buy this game or it'll be a case of spontaneous combustion? Maybe. **K.R.**

Finalizer:

Title: Solomon's Key. **Supplier:** U.S. Gold (Units 2/2, Whitton Way, Midvale, Birmingham, B6 7AL). **Tel:** 021-356 1388. **Price:** £9.98. **Machine:** C64.

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

ON FIELD FOOTBALL

On Field Football is the latest Activision game to be re-released as a Freshly budget game. Written by Gamastar, On Field Football attempts to capture the essence of Super Bowl excitement and fun.

Four-wide football played between two teams of pygmy and players captures the essence of a poor game. The instructions are brief to a point, of not telling you everything you need to know and only presents an almost meaningless table of plays, formations and the joyless movements required to select them.

If you manage to decipher the table you find an extremely limited selection of offensive and defensive plays and with only four players you barely have the manpower to execute them. The quarterback not only carries the ball, he also doubles as the runningback and the shooter!

The game also features a computer opponent that will punt you into the ground and leave you wondering why you spent \$9.99 on a game like this. **T.H.**

Finalizer:

Title: On Field Football. **Supplier:** Freshly, First Floor, 64-67 New Oxford Street, London WC1A 1PS. **Tel:** 01-779 6755. **Machine:** C64. **Price:** £1.99.

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



Easy Count

A word counter for Easy Script users.

By M. P. Leach

Easy Script is probably the most common wordprocessor in use on the C64. One of the main problems with the program is that it will not allow the user to perform a count of the number of words that are in a document. If you need an accurate count then the only way is to count the words by hand. Until now that is.

Easy Count is a program that will count the number of words that are in any Easy Script file.

The program looks for a non-space character, then searches for the next space until the counter is increased.

If a format or printer command is

found (i.e. F1 or F2) the count is halted until a semi-colon is reached or a carriage return is found. This does mean that all format or printer commands which are not followed by a semi-colon must be on a separate line. The enhancement commands (see pages 8,9 of the manual) must not have a space between them and the following text, or they will be counted as single letter words.

Getting it in

The program is presented here as a Basic Loader and should be typed in

using the Symas Checker program found on the LISTINGS page.

When RUN the program will automatically create the machine code.

Follow the on screen prompts to use the program. The directory of the disk in the drive may be read from inside the program. For those technically minded the program resides in memory from \$C000 to \$C200 and is associated with SYS 49287.

See listing on page 84

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Art 6	£10.00	Art 7	£10.00
Art 7	£10.00	Art 8	£10.00
Art 8	£10.00	Art 9	£10.00
Art 9	£10.00	Art 10	£10.00
Art 10	£10.00	Art 11	£10.00
Art 11	£10.00	Art 12	£10.00
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Communications Corner

Keep up to date with what's on in the communications world with David Janda.

As I write, the PCW show is coming to an end. There was nothing new, come wise for the C64/128, but there were several new developments with regards to online services. Both Compuserve and Micronet were at the show attracting new customers and showing off their latest features, and in all it was an interesting show for the commo enthusiast. Let's have a look at what was on offer.

Gateway Developments

Micronet is developing new gateways to and from its database. In simple terms, a gateway is an electronic link between one computer and another. Shades, Micronet's Multi-User Game (MUG) is an example of a gateway, and Micronet's announcement of a scrolling gateway is a development from this.

The scrolling gateway enables users with dumb terminal software to use scrolling types of services via Micronet. Going back to Shades, the output from this game is converted into the viewdata format in order to be displayed on the screen. The new scrolling gateway simply removes the conversion process and leaves the output as text on a plain background with no fancy graphics or colour.

Technologically speaking this is no big deal, and begs the question, why have scrolling text when you can have viewdata?

Well, some applications such as using Telecom Gold via the Interlink gateway are best suited for scrolling type displays. Micronet are developing a scrolling gateway for Interlink users, but this shall not be ready before Christmas.

The first scrolling gateway should already be in operation and is for Shades players. Users will be given the option to play Shades in the standard format, or with scrolling software. Apparently, there is a speed advantage in playing MUGs with scrolling software.

Andy Walker, who runs the excellent Soley Sixty Four (SS4F) area on Micronet has developed a stand-alone scrolling package for C64/128 users that can be downloaded from his area free of charge. This will be compatible with the Commodore modem, OEL communications, multi-modem and Maxing software, and will display blue text on a white background. The idea is that you use it to log onto Micronet and go to the area where the scrolling gateway is. The software will automatically detect

when the gateway is being entered and will display 40 columns by 24 lines.

Let's Chat

Micronet are also working on a conferencing system. The idea being that you go to a particular area (called a meeting), meet in the reception area or bar, pick up a key, go to a room and have control over who can and cannot enter. You can even pull down a shade thus preventing anyone from knowing who is in your room. Of course there will be commands such as lock, close, etc to enable you to do all this.

Teleconferencing is not a new idea. British Telecom operate such a service whereby several people can have their phones 'linked'. American databases such as the Source and CompuServe have them as well. It is important for Micronet to ensure easy use of the conferencing system, with simple, clear commands to operate it. The idea of a conferencing system is for a group of people to meet and discuss, and not get bogged down in the technology of the system itself.

I understand that the system will also have the option of being accessed by a scrolling gateway.

Both the Shades scrolling gateway

and the conferencing system will be chargeable services, but these have not been final yet.

Commodore Modem RIP

Companet have a problem - they have no modem! The Commodore modem is no longer in production and Companet Teleservices have run out of stock. Currently they are looking for an alternative modem for C64/128 users, and it's my belief that they are Ariadne Software (who wrote the original Companet Terminal software for the Commodore modem) will develop a software patch to be used in conjunction with the Miracle multi-modem and Mustang software packages. Companet hope to have an alternative by Christmas.

New Look, Companet

Companet is now running on its own mainframe which reaps the benefits of a system which is much faster in operation (although not as fast as Proxl/Microtel). The system is

having a bad case of teething trouble but this should be sorted out in time - there is still a long delay when initially signing on, and more often than not I have suffered the "Sorry, all links to Companet fail" message. This is no fun especially when it costs 4.4p plus VAT for the phone call only to be greeted with that message!

Companet MUD and FEDERATION MUDs are not operational either, but all should be in order by Christmas time.

Do not despair - not all is doom and gloom. The speed increase has to be believed, and when I tried out the system there were very few of the C, N and S type errors that were common on the old system. Parallax is now so fast that the special scrolling software is being given away as a free link. This is because the text scrolls so fast that you need the buffering in the software to look back at what has just whizzed by!

A new development from Companet is that by Christmas time a popular date is given both the Amiga and ST will be supported

Concentrating on the Amiga; the software to access Companet will cost £18.95. It makes full use of features, with a windowed menu operated display, pull-down menus and point and click gadgets for commonly used functions.

Finally, the pricing structure for Companet has now been greatly simplified. There is the standard subscription which costs £12 per quarter, and gives you limited access and not as many privileges as the Gold subscription, which costs £15 per quarter. In addition, for an extra £5 per quarter you can get unlimited off-peak access without the additional network charge. Obviously, the Gold plus unlimited off-peak package is going to be attractive for those who would like to use the system on a regular basis. However, for those who would like to test the waters a Standard subscription is ideal, and you can upgrade to Gold and request unlimited access online.

Well, that's it for this month - I'll be back soon with some more communication chit-chat. ☺

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The Excelsior behaved admirably throughout. It does exactly what the 1541 does.

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The Excelsior is, though, seems to copy faithfully with commercial software.

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with the Excelsior+ had come out two years ago.

— Commodore Computing International

I'll rather buy an Excelsior+ than a 1541 or a 1540 or a 1541.

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Budget Calc

Keep track of your money with this budget program.

By Simon Phillips

Budget Calc is a budget utility based around two spreadsheets. The first contains the actual monthly figures, the second contains the estimated figures.

Budget Calc is split into several sections, the main program, review program, end program, changing subjects and changing months. The first three RUN automatically, and interact with each other. The last two programs have to be LOADED separately.

Changing subjects and months

Budget Calc has the capacity for 16 subjects, and these can be changed to suit the user. The subjects are stored in a sequential file on disk, the same for the month order. Each of the subjects must be no more than 12 characters in length.

Five different people, financial years change. With Budget Calc, you can have your financial year from Jan to Dec.

When LOADING and RUNNING Budget Calc, you will be asked for the present month, this is for the previous, the purpose, and the advance year facility. The program compares the month with the start of the financial year, and if they match, then the year is updated. Once the space bar is pressed, data is loaded. This is in three separate sequential files. The first data is the actual and estimated figures, along with back-dated figures, in the 'budget data' file. The second data is the subjects, LOADED from a file called 'budget subjects'. The last is the month sequence.

Once the red lights on the disk drive go off, a command window is printed at the bottom of the screen, and the spreadsheet window is displayed in the upper and middle of the screen. The window is moved around the spreadsheet by using a joystick in port No. 1. Pressing the fire-button and moving the joystick

left or right will cause the large cursor to move through the five commands. The cursor has a wrap-around feature, and the inverse command denotes which mode you are in. Pressing the fire-button will execute these commands. They are:

REVIEW, MOVE, AMEND, END, ACTUAL/ESTIMATED

REVIEW

Further LOADING is required for this function and this is done automatically. Once LOADED, a main screen is printed and five options are given:

Review month;
Review subjects;
Review totals graphically;
Review profit and loss;
Returns to the main program.

The first two options allow the user to review figures back-dated by three years. Once these options are executed, only half of the months or subjects are displayed. By moving the joystick up and down, access can be gained to the rest of the figures. Pressing the fire button will display the menu once again. Review Totals displays graphs of the past and present annual totals. There are two sub-routines for this option. The first is the totals not exceeding 4000 and the second is for totals greater than 4000.

Pressing the fire button will return you to the menu.

Review profit displays the spreadsheet as a grid. After a couple of seconds boxes will be coloured either red or green. A red box means that at that position on the spreadsheet the actual figure is greater than the estimated one, and so is classed as a loss. A green box means a profit and that the actual figure is lower than the estimated. No doubt there will be a lot of red boxes at the end

of the grid because there are so far, no actual figures. Pressing the space bar will return you to the menu.

MOVE

This command enables you to move around the spreadsheet.

AMEND

This command is used in conjunction with the 'move' command. It is used to change, add and correct figures. Use the move command to position the entry place on the screen. Enter the amount wanted and press fire. Three reverse characters will be displayed in the top left hand corner of the first figure. This is now your cursor and you can move it around the four by four square of figures. Simply type in the new figure (only using three characters) and then press RETURN. If you have made a mistake in typing in the new value and you have not yet pressed RETURN, then type out the figure again and it will be printed over the mistake. If you have made a mistake and have pressed RETURN, then you will have to go through the routine again. If at any time you want to get out of the amend routine then press the fire-button and you will return to the move command.

END

After selecting this command, the 'end end' program will be LOADED and RUN. The program does not need any explanation of how to use it. It allows the saving of data, and the process of making hard copies. Data will only be saved if: (a) figures have been altered or added, (b) the advance year facility has been increased.

Printing is straight forward, and if you have not switched the printer on, the program will tell you to switch it on, you can return to the main program or end which will result in a cold start of the computer.

ACTUAL

This displays the spreadsheet you are viewing. There are two spreadsheets, as explained. The word 'estimate' replaces 'actual' when the estimated spreadsheet is displayed, and vice-versa. This is displayed everytime you use the spreadsheet, so as not to get confused when viewing figures. All of the above commands are available in estimated and actual mode.

Getting Started

When starting off with Budget Calc only the listings presented here will be on disk. The data files have to be created, before any of the program will function. These small programs **BUD DATA CREATE**, **BUD M/S CREATE**, **BUD MON CREATE** are those that I actually used when wanting to make the individual files.

BUD DATA CREATE

This file will create sequential data for **BUDGET DATA** on disk. This is the longest file that has to be made.

The variables have the following meaning:

54 year advance status
 CM present year - J
 Y0(a) dim of estimated figures
 H0(a) dim of estimated figures
 54,55,5U are strings which contain last three years monthly totals.
 RA,RR,RC are strings which contain the last three years subject totals
 G(1), G(2), G(3) contain the last three years actual totals

BUD SUB CREATE

This file will create the data for **BUDGET CH0(a)** is a DIM containing an inputted string.

56 and 5C contain the number of spaces needed to pad the start and end of the string.

BUD MON CREATE

This will place the data for the file **BUDGET MONTHS** on disk.

The variables M0(1) to M0(12) simply contain the month names.

NOTE The above are only needed when creating the files for the first time.

BUDGET CALC PROGRAM DESCRIPTION

LINE	DESCRIPTION
100-420	Printing of screens and input of present month.
430-480	Dimensioning variables and strings.
490-500	Loading actual and estimated figures.
510-580	Loading past figures and totals.
590-640	Loading subjects.
650-680	Conversion of zero figures into ----.
700-730	Conversion of figures to spreadsheet variables.
750-790	Loading month sequence.
790-890	Setting variables and strings.
900-1000	Printing of the spreadsheet.
1000-1030	Boundary limitations.
1040-2000	Amend routine.
2010-2150	Movement of command cursor.
2360-2510	Subroutine for calculating subtotals the actual figures.
2620-3090	Subroutine for calculating subtotals the estimated figures.
3200-3460	Advance year routine.
3470-3490	Loading of other programs.
3500-3640	Conversion of variables to the spreadsheet.
3650-3830	Saving of important variables to be loaded again.

BUD REVIEW

LINE	DESCRIPTION
100-330	Loading of important variables.
340-350	Converting actual figures to past figures.
360-390	Menu.
700-980	Review subjects (1).
990-1180	Review subjects (2).
1190-1350	Review months (1).
1360-1520	Review months (2).
1530-2050	Graph 1 (0-4000).
2160-2300	Graph 2 (0-9999).
2310-3200	Profit and loss screen.

BUD END PROGRAM DESCRIPTION

LINE	DESCRIPTION
100-250	Loading of important variables.
260-280	String defining.
300-350	Save.
360-360	Menu.
900-940	Test to see if printer is on.
1050-1170	Inform user that printer is not on and systems reset.
1180-1200	Branching of different hard copies.
1210-1430	Actual figures hard copy.
1440-1550	Estimated figures hard copy.
1660-1920	Actual and estimated figures hard copy.

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Across the Board

More and more companies are producing adventures based on well-loved board games - watch this space for the latest releases.

By Tony Hetherington

What have Trivial Pursuit, 2100 Baker Street, Clue and Autochess in common? The answer is that along with Chess, Bridge, Monopoly, Scrabble and Cluedo they are part of a growing band of board games that you can now play on and with your D64.

Intellectual Classics

Classic games such as chess and bridge have always been computer favourites and have now reached the standard where they can usually beat their human players. Most software houses have entered a contestant into the classic games stakes that has now replaced the urge to produce fruit machine or Orfeon games.

The main players in the chess stakes include Mastertronic's Masterchess, with the cheapest (at £1,999), AudioLogic with Grandmaster (that includes a free Orfeon game) and CDROM's Colossal Chess 4. All three will give you a good game and include features to allow you to tailor the game to your level and alter screen colours, provide you with move hints and allow you to backspace if things don't go according to plan.

Colossal Chess 4 also includes options to display a 3D board, replay the game so far, and six different types of game from full-blown tournaments made to problem mode where the program will help you solve magazine chess problems.



Colossal Bridge 4

Bridge as a game doesn't seem to convert to computer logic as well as chess, probably because at least half of the game is in the understanding with your party and the rest is a combination of luck, card skill, bluffing and a good bidding system. Unfortunately, the trio of Colossal Bridge 4 (CDROM), Classic Bridge (Amiga) and Oxford Bridge (Thinking Games) cannot hope to simulate this and ends up being a

poor substitute for Bridge addicts, abandoned without three other players.

There can be some help for beginners who want to learn the game without the embarrassment of the long post-mortems that Bridge players soon to retire and will find good value in *Colossal Bridge 4* as the pack also contains a copy of *Begin Bridge* by G. Fox that will teach you more than the limited tutorial.

Old Favourites

The Waddington games, Monopoly and Cluedo are quickly attaining classic status with the world famous property game celebrating its 50th birthday last year. Both are now available in a triple pack from Leisure Genius (along with Scrabble) and will provide computer opponents for 300 days of the years when the family don't want to join in. Leisure Genius has just updated *Clue Scrabble* and has recently launched *Scrabble deluxe* which features a vocabulary of 20,000 words and eight different skill levels. A full review of *Deluxe Scrabble* is included in this month's IQ.



Monopoly

The Latest Craze

Last year, *Trivial Pursuit* stormed the shops around Christmas time and found its way onto coffee tables throughout the world. Thanks to Denmark it has also appeared on the C64 and has now been followed by a young player version and the Baby Boomer collection for all those born in the 60s. Since then there have been other trivia games including DataSoft's *Mind Pursuit* in which you have to answer questions to get across a game track and Arcana's *Powerplay* where correct answers give your pieces the power to fight in the arena.

Soft's *Colonial Conquest* is obviously inspired by Risk and gives you the chance to stretch your throat for global domination. Against other human or computer controlled opponents that play the major powers of the world, you conquer and send out your armies and fleets to conquer new territories. This new land will give you more resources to build more armies, or build or undermine existing regimes, pay off unwieldy enemies or get spy reports on opponent army strengths.



Sherlock

Sherlock Holmes I Presume?

221B Baker Street (DataSoft) casts you in the role of the world's most famous detective as you compete against up to three other players (Doctor Watson, Inspector Lestrade or Irene Adler) to solve one of thirty different cases that include the curious case of the "empty handed thief", "the amorous sailor" and "the peculiar showman".

Once the characters and case have been selected then each player should read the case notes in the enclosed booklet so that they know what they're looking for before the game begins. From then on the play continues as each player in turn, throws a die, and then moves around the board that represents the town. Whenever you enter a building you will receive a clue or part of a clue that can be coded so that only you can understand it.

Armed with these clues and badges you can lock buildings to keep the other detectives out, the case is on to solve the case. Thirty different cases should keep digital detectives scratching for some time.



221B Baker Street

Shoot!

Brian Clough's *Football Fortunes* is a computer game that's also a board game! Inside the packed box, alongside the game tape or disk you'll find a board, counters and over 100 playing cards. These cards represent the individual players that you must buy and sell to form the right combination of

defense, midfield and attack to win league and cup honours.

However, the best laid plans of mice and football managers are often disrupted by chance that come in the form of 'computerised chance' or 'manager luck' and 'inflation' problems aside in which you can gain and lose money and players. The fun really starts when a star striker comes off for another just before a big game.

Autotiled is a role-playing game (available through Microprose) in which you must "drive offensively to save your own life". It is based on the incredible Steve Jackson game of *Car Wars*. In the computer version you must build a custom car, pile on armour plating to protect it then arm it with lasers, machine guns, and flamethrowers before you dare take to the open road.

Unfortunately, you need money to buy the weapons and since you begin the game desperately short of cash, your only chance is to risk life and limb by entering *Amateur Night* in the Arena. Survive that and you may win enough money to build a car. Later on in the game you'll be able to gamble in casinos, track across futuristic America, carry special deliveries or just go on the open road on a vigilante trip.

Soon Available

A second game from the excellent Steve Jackson Microgames series is coming soon from Origin and is a computer version of *Ogre*. This will be a wargame in which one side has an army of hovercrafts, tanks, hovertanks and infantry lined up against a single unit. Unfortunately, that

unit is an *Ogre*. A massive Cybertank that breathes with missiles and guns. It's going to be a close fight.

There's more board game conversions to come as *Dynast* just served more *Terral* *Paradise* question packs. *Apocalypse* is set to release its version in September and *Graphic* Graphics has announced that they're computerising the *Games Companion* in a "new and wacky form" that includes snakes and ladders but with real snakes, and *Lesare* *Cassini* (*Vigra*) has plans to extend its range of games with *Scraps* and *Diplomacy*! If you haven't played *Diplomacy* before you're in for a surprise! Seven human or computer controlled players being, cheating, bribing, stealing and fighting for control of Europe!

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Sprite Library

Kicking off our Sprite Library series, we look at the full potential of the sprite.

By Mike Benn

Sprites are undoubtedly one of the most useful graphic aids available to the programmer. They have the ability, on command, to move freely around the screen, change colour and shape and to create realistic animation which enables them to become an essential element of good graphic design. They can be easily accessed from Basic even if they do need a few PEEKs to get them working.

The 'User Manual' that comes with the computer describes, through instructions and examples how to put sprites on the screen, move them about and manipulate their parameters in a number of ways - but hardly taps their full potential of the sprite or the computer programmer.

Programmers of arcade games are well aware of the difficulties that have to be overcome because the system development of new games. Programmers of the CBM are only too well aware of the difficulties that have to be overcome because the system designers overlooked the need for sprites.

Flexible Sprites

Sprites are not just used in arcade games. Their flexibility makes them adaptable for use in all types of programming. Simulations, education based programs, business software and many utility programs often utilise their special characteristics. It is, however, the arcade game that puts sprites, to best use.

One of the most impressive uses of sprites is the creation of animated graphics. By running a series of similar, but slightly different pictures, the eye and brain are tricked into believing the sprite is alive. As with all

forms of animation, the best results require many individual designs to produce a smooth and credible animation. The outstanding animation quality in 'Science Game I & II' is a fine example of the excellence that can be achieved.

Pre-planning Required

Creating and developing a new game requires considerable pre-planning to attain maximum impact in all areas, and good sprite designs are particularly important. Take for example, a simulation of an aircraft coming into land. If it touches down too hard or overshoots the runway, it could be that a sprite 'explosion' will add realism to the game.

Sprites must be designed to accommodate this or other eventualities even though only one of the designs is ever called upon at one time. The sprite registers include collision detectors which help the programmer, and can be read by PEEKing them, to see if a sprite has collided with another sprite or hit something in the background. Breaking a game plan down into individual sections will help in the process of deciding which type of sprite designs will be the most effective.

Machine code programmers have the distinct advantage of speed, in programming 'shoot-'em-up' games, where in Basic is slower. In machine code you can put 64 sprites on the screen at the same time rather than just the eight, allowed by Basic. It's difficult to know what type of program would use so many sprites, but it can be done.

There is a halfway house that

Basic programmers can use: SYS calls and Basic extensions. A SYS call is a machine code subroutine that can be called from Basic to handle a part of the program where speed is an advantage. Such subroutines are often published in User Communities and are well worth looking out for. Basic extensions is a software program written to supplement the computer's own somewhat limited Basic commands.

Designing Sprites

Designing sprites can be very time consuming, even more so if you follow the technique used in the 'User Manual' which explains the theory of sprite creation and which requires large amounts of arithmetic to produce one sprite design. This seems a shame when you have a computer that can do this type of simple maths standing on its joystick.

A useful piece of software is a 'sprite editor' which allows you to concentrate on the design and leaves the computer to worry about the mathematics. A word of warning though - a sprite has no artistic skills of its own, and relies totally on the skills of the operator.

Sometimes, one sprite isn't large enough on its own to provide the design you want. This is overcome by placing two or more sprites next to each other in a suitable manner. The pre-designed aircraft that accompany this article use this capability, working side by side, but when seen on the screen, appear as one. The sprites are stored in memory alternatively so we start off with Sprite I then Sprite II for the first design. The following designs stored in a similar manner so when the sprites are run in a program, the order

is known. A Basic program that would animate four sprites as one larger design would be used as follows:

```
FOR SP = 0 TO 30
STEP4:POKE2048,SP:POKE2044 + 1
:POKE2042,SP+2:POKE2043,SP +3:
NEXT
```

The STEP command steps every four sprites so that the first part of the design is always read by the first sprite pointer.

The complex animated sequences found in any good arcade game needs a great deal of artistic and creative skill to produce. To design a set of sprites from scratch can take days of work and can still fall short of the standards required. The answer to the problem maybe found in Sprite Library.

A wide selection of pre-designed sprites have been saved in Basic loader form to create the basis of an extensive 'Library'. Illustrating and animating everything from a poodle to a square.

Forms of Flight

Let's start the series by taking to the air in three different forms of transport. Starting with a small jet followed by a helicopter flight and finally a white knuckie ride under a hand glider. Both the plane and the helicopter approach the viewer from the distance and turn to the right. The hand glider is not fully animated as space did not permit. However, there should be enough key frames for you to fill in the missing animation. All the sprite definitions require two sprites.

Hex	Decimal	Description
A0-B7/	160-163	Jet plane approaching and turning to the right.
88-CA/	134-202	Helicopter approaching and turning to the right.
C0-C3/	192-195	Helicopter blades turning while helicopter faces the viewer.
CA-C9/	202-205	Helicopter blades turning while helicopter faces facing right.
CE-D5/206 - 213		Hand glider moving to the right.
D6-D3/214 - 215		Hand glider flying upwards to the right.



D8-D9/216 - 217

Hand glider getting ready to land or has just taken off.

DA-D6/218 - 219

Hand glider on the ground just about to take off or has just landed.

DC-DD/220 - 221

Hand glider on the ground just under canopy.

D6-D9 /222-223

Hand glider on the ground.

Getting it all in

Type in the basic loader as published and save it - don't run it or it will self-destruct. Before running the loader program you will need to reset the computer and type the following:

```
POKE430,POKE44,66:POKE
16384,NEW and press RETURN.
```

This will trick the computer into believing that the Basic now starts at 8400 instead of 8000. Load in the

Basic loader and run it; if error free, the program will automatically save itself as a block of data. If you reload that data in the future remember to add a 1 after the device number. The data is saved in the following location \$2400-\$33FF.

The sprites run from 160 to 225 in a compression to avoid the area \$2000 traditionally set aside for redefined character graphics and to avoid the need of typing in line after line of data.

If only one or two sprites are required then use this formula: (sprite block No.-160)*4 + 196 = the data line number at which that sprite blocks data starts.

Remember to type in the following three lines of data and alter the variable M to the number of data lines you have in your finished program, less 1.

The small basic program Aircraft Display will animate the sprites in both non-expanded and expanded forms on the screen simultaneously. To hold an any sprite enter the same number for Start and End.

Any Sprite Editor program will enable you to change and adapt the individual sprites to your own requirements. □

Lister 128

If you've got a printer and disk drive, you'll find the program a handy utility for your 128.

By Kevin Bligh

Using Lister 128 will enable you to take a program saved on disk as an ASCII file and for it to the printer. Nothing extraordinary in that, you may think, except that the program does not have to be loaded into memory. Well, Lister will also perform a few other things. First the listing is printed as pages (50 lines to a page); this will mean that the most important line is not printed across the perforations (as normally happens).

Each page is given a heading of your choice, together with the date. All lines of the program are indented so all lines start in a straight line, irrespective of the line numbers. If a line occupies more than one line on the print out the continuation will also be indented, e.g.

```
1000 REM THIS IS A TEST
      LINE IT WILL RESPLIT
      OVER TWO LINES
```

You will have the option to list the program in either upper or lower case characters. A page three is executed at the end of the listing. To save a program as an ASCII file enter:

```
DISKPP#1,1<FILENAME> >A,W"
CMD1
LIST
PRINT #1
CLOSE
```

Once the listing is finished you will have the option of deleting the ASCII file. The variables used are as follows:

See listing on page 83

```
FN : Name of the file to list
NB : Heading for listing
DB : Date for listing
PE : = "U" or "L" for upper or lower case
L : Counter - Number of lines printed
P : CHR$( code for lettering to use for printer (L=143 / U=113)
AB : Characters read from disk file
LS : Line to print
A : Counter - Length of LS
BD : Line number and spaces for indenting
SPS : String of 8 spaces
X : Used as FOR/NEXT loop for page three
QB : List another program Y/N
```

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

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

[S+2] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+2] means exactly the same thing except that the Commodore key (bottom left of the keyboard) is held down instead of the shift key.

If more than two spaces appear in a statement then this will be printed as [SPC4] or, exceptionally, [SSPC4]. Translated into English this means press the spacebar four times or in the latter case hold the shift key down while you do it.

A string of special characters could appear as:

```
[CTRL N, DOWNLEFT, BLUE, F1,C]
```

This would be achieved by holding

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

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

```
[SS][C*]
```

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

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

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

```
CC=>PI(PI);
```

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

PROGRAM: SYSTEM CHECKER

```

1 REM SYSTEM CHECKER - BIRD DOYLE
2 BL=10 LN=70 BR=8000
30 FOR L=0 TO BL:FOR M=0 TO LN
40
50 BR00=0:IF <MID$(BR00,M,1)="" THEN
60 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
70
80 BR00=0:IF <MID$(BR00,M,1)="" THEN
90 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
100
110 BR00=0:IF <MID$(BR00,M,1)="" THEN
120 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
130
140 BR00=0:IF <MID$(BR00,M,1)="" THEN
150 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
160
170 BR00=0:IF <MID$(BR00,M,1)="" THEN
180 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
190
200 BR00=0:IF <MID$(BR00,M,1)="" THEN
210 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
220
230 BR00=0:IF <MID$(BR00,M,1)="" THEN
240 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
250
260 BR00=0:IF <MID$(BR00,M,1)="" THEN
270 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
280
290 BR00=0:IF <MID$(BR00,M,1)="" THEN
300 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
310
320 BR00=0:IF <MID$(BR00,M,1)="" THEN
330 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
340
350 BR00=0:IF <MID$(BR00,M,1)="" THEN
360 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
370
380 BR00=0:IF <MID$(BR00,M,1)="" THEN
390 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
400
410 BR00=0:IF <MID$(BR00,M,1)="" THEN
420 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
430
440 BR00=0:IF <MID$(BR00,M,1)="" THEN
450 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
460
470 BR00=0:IF <MID$(BR00,M,1)="" THEN
480 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
490
500 BR00=0:IF <MID$(BR00,M,1)="" THEN
510 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
520
530 BR00=0:IF <MID$(BR00,M,1)="" THEN
540 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
550
560 BR00=0:IF <MID$(BR00,M,1)="" THEN
570 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
580
590 BR00=0:IF <MID$(BR00,M,1)="" THEN
600 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
610
620 BR00=0:IF <MID$(BR00,M,1)="" THEN
630 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
640
650 BR00=0:IF <MID$(BR00,M,1)="" THEN
660 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
670
680 BR00=0:IF <MID$(BR00,M,1)="" THEN
690 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
700
710 BR00=0:IF <MID$(BR00,M,1)="" THEN
720 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
730
740 BR00=0:IF <MID$(BR00,M,1)="" THEN
750 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
760
770 BR00=0:IF <MID$(BR00,M,1)="" THEN
780 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
790
800 BR00=0:IF <MID$(BR00,M,1)="" THEN
810 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
820
830 BR00=0:IF <MID$(BR00,M,1)="" THEN
840 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
850
860 BR00=0:IF <MID$(BR00,M,1)="" THEN
870 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
880
890 BR00=0:IF <MID$(BR00,M,1)="" THEN
900 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
910
920 BR00=0:IF <MID$(BR00,M,1)="" THEN
930 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
940
950 BR00=0:IF <MID$(BR00,M,1)="" THEN
960 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
970
980 BR00=0:IF <MID$(BR00,M,1)="" THEN
990 BR=L*LN+M+1:GOTO 70:BR00=BR00+1
1000

```

by Eric Doyle

Checksum Program

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

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

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

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

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

















press RETURN again.

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

Lower Case

Many of the listings are presented in lower case. To turn your computer to lower case mode press the Commodore key and the SHIFT key at the same time.

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

Macronomic	Symbol	Keypress
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[ROUND]		⏪
[LBARROW]		←
[UPARROW]		↑
[F1]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		rev text
[Cletter]		CTRL + letter
[Mletter]		SHIFT + letter

Compunet

In the third part of our communications series, we look at the various uses of Compunet.

By Jennifer Goldsmith

Compared to other communications services, Compunet is a relatively new system. Its official launch was in September 1984 and was a joint venture of Commodore UK and ADP Network Services with ADP providing the service and Commodore providing the modems. However, since Commodore was no longer able to provide the modems or to continue to repair the faulty existing ones, they pulled out and left ADP on its own.

Security Advantages - Modem

However, the Commodore modem was not all bad for the chip in the modems, provided both the software to access Compunet and a unique identity which ADP could use as security. This security is used in two ways. Firstly, it is used when you log on to the system for you can only log on using your own modem. When you register with Compunet, you have to provide an identity number of your modem, so even if you have the correct password but try to log on using your friend's modem, you will not be allowed on the system.

The second use of the identity number is in downloading protected programs, as protected programs will only run on your computer if your modem is in place. Unprotected programs, on the other hand will run without your modem in place. On Compunet, protected programs are denoted by the letters PP and unprotected programs by a single P.

Logging on to Compunet

Once you have obtained your modem and have acquired and fitted the telephone jack, you can plug your



modem into the phone line (see October's issue for more details), you have to register with them.

This is necessary for two reasons. Firstly, they have to know who to charge and the address to which bills and other correspondence can be sent, and also to give you a user identity and password. The user I.D. will be used by other users on the system to send you mail. Once you have registered and plugged your modem into both your computer and the phone line, you are all set to dial up.

To do this you simply type CONNECT (return) and the computer will ask you for the phone number which you type in, not forgetting to hit return afterwards. The modem will then dial the computer and when you are connected the screen colour changes from blue to mauve and various words like 'connecting' are

seen. You will also see the word 'linking'. This linking process is giving you some extra software which you should save immediately once you have left the system. You save it with the command UNSAVE (return).

On future occasions you load this software with the command CNLOAD before typing CONNECT. This additional software stores the phone number you have used, so you will not have to type in the phone number again unless you want to use a different phone number.

The Charges

The various charges are quite numerous but easy to understand and are cheap when you consider what you get for your money. There are three different rates of subscription, basic at 29 per quarter, standard at 32 per



DIE	reveals another directory
SHOW	returns to the previous directory
BACK	
GOTO	goes directly to the frame with that number or name
UCAT	displays a catalogue of your uploaded frames
MAIL	searches the electronic mailbox
ACCT	shows you your bill
SAVE	saves a downloaded program
EDIT	allows the editor
LEAVE	disconnects you from CompuNet (this is the only way you should disconnect from CompuNet otherwise you may get charged more connect time)
PRINT	prints the current frame
LIFE	used to extend the life of a frame
BUY	used to download software
LOAD	loads a frame or program from disk into the memory of your computer
UPLD	uploads a text frame or program onto the system
VOTE	the CompuNet clip-onator - allows you to vote on software
HELP	for when you get stuck

quarter and gold at £15 per quarter. You can upgrade from one to the other at any time by paying the difference between the two rates.

However, to downgrade you have to give one month's notice and you can only downgrade when subscriptions are due. The rate which is variable to you, will depend on how much you want to upload onto the system and/or how long you want to operate the system. Details will be supplied by CompuNet when you apply for registration and full details are on the system.

There are also connect charges, storage, distribution and administration, as well as miscellaneous charges. However, before you turn white with fright, let me tell you it is not that bad. The most significant charge is the connect time charge.

Although this charge is 80p an hour after 6pm in the evenings (weekdays) and all day at the weekend, if you use the system for more than five hours a quarter it is worth upgrading to a gold account and paying a fixed £3 a quarter for unlimited free connect time in the evenings and weekends. There is no substitute for the daytime weekday charge (100m from 6pm to 6am) at 64 per hour but usually only business users access CompuNet during those hours. Storage charges of 1p/frame/day/ are small unless you have many frames on the system, in which case a gold account may be profitable.

Distribution charges are like commission rates. If you want to sell something e.g. a program on CompuNet, CompuNet will take between 40% and 50% of the price as its share.

Administration charges are only charged if your bank refuses to pay a cheque in a direct debit (once you have filled in the mandate).

Miscellaneous charges are for special facilities, many of which are only available to gold subscribers. Details can be found on the system.

Partyline... Type Help for help!

Press RETURN twice to send commands or messages.

Sample Partyline commands:-

Mailto (followed by a name)
 name: calls you who's in prime
 name: calls your name to enter
 a different room
 See the cursor keys up/down to
 SCROLL back through messages.

CHAT calls you from pub.

Mailto Ivan Etouanitcha

Finding Your Way Around

Once you are logged on to CompuNet, you will notice that there is a whole series of commands near the bottom of the frame. The other name for this is the 'directory'. Here is a list of the commands with a short explanation.

The editor is an area which allows you to print out frames and to edit. The editor shows the last 12 frames (excluding indexes) which you have accessed. In some areas of CompuNet you will find there are 'forms' to fill in, e.g. if you want to join a club you can edit or fill in these 'forms' in the editor without going off-line and send them using the mail facility to the correct recipient.

The editor also exists off-line for you to input and edit frames. The editor can hold up to 8K of data. The editor commands are:

PUT	used to save the frame currently on the screen to disk
STORE	saves ALL the frames in the editor to disk
PRINT	prints the current frame
FREE	shows how much space is left (in editor)
GET	similar to LOAD but frames go into editor
RETURN	returns from editor to where you were before you went into editor
HELP	for when you get stuck
EDIT	when you first enter the editor you are put in edit mode. You have to use this command to be able to edit
LAST	when you first enter the editor you see the last frame you accessed. To proceed 'backwards' you use this command
NEXT	if you have used LAST and want to proceed 'forwards'
NEW	creates the current frame WITHOUT showing the next frame
ERASE	erases the current frame AND shows the next frame
COPY	to copy from one area to another

The Structure of CompuNet

When you are at the first page, the main index, which is the first index page you will see on the system, you will notice a list of names. These are, at the time of writing: Carz Highlights, About Com, Live Wire, Future park, Club 128, Zap Club, The Knight, Comics, Show Case and Shopping Centre.

As you use the cursor to reach the item you want, you will notice that there are numbers of names to the left of the items - these are the page numbers of names. To the immediate right of the item is the letter T followed by a + sign. T indicates that a frame of text is present and the + sign means that there is a sub-directory.

Other letters apart from T can be found. These are D, F and P. D indicates a 'dummy' page, F a program and P a protected program. There is a column to the extreme right of the screen. Use the function keys F7 and F8 (shifted F) and see what happens!

Function keys F1 to F8 are used as short cuts to various routes. Each index shows where these will go. CompuNet has a tree structure, i.e. a main index with a sub-directory below each one of the directory items listed and so on.

However, in CompuNet there is no limit to the number of levels you may have and the page numbers have no bearing on the levels, unlike Protel.

What's on CompuNet

It is obviously both impossible and impractical to list everything on CompuNet. Things are changing every day. Basically, CompuNet has something to please everyone, whether it is multi-user games, art galleries, diaries, educational software, business software, various communications, utilities, clubs, users groups including R/PUG and OCC, hobbies like CHESS and amateur radio, teleshopping, daily computer news and much, much more.

One interesting and unique area is the JUNGLE, which is the area which you can enter your own contributions. This can be anything from notes and comments to long stories and even software. Yes, you can even sell, or SELL your own software, at a price to be determined by you, which should be reasonable for the product. Of course

CompuNet takes its commission but you get the best part. This area gives you a chance to get other people's views on your ideas.

There are six main areas in the JUNGLE, which are software, small ads, clubs and societies (excluding those which have a dedicated area of their own), hobby corner, user notices and jobsnet. Thus, the JUNGLE is an exciting ever-changing area.

MUD or Multi-User Dungeon, is an adventure game which was originally developed at Essex University and has become the software it was made available on CompuNet. The only disadvantage with the extension MUD provides is the charge for playing it PLUS the phone bill!

Teletraveller on CompuNet is numerous and varied. There are five programs of all descriptions whether it is a quiz giving away his latest program of all kinds, e.g. utilities, educational, etc.

Like what you can purchase software for numerous tasks from communications and utilities to business software. And there is software for various communication machines, such as the C84, C128, Amiga and even the PET & +4 & C16.

The Future of CompuNet

When CompuNet first started, the system was terribly slow but in July, ADP moved to a new location, with new phone numbers, new phone lines, new computer, new software but the same staff. After the initial teething problems such as RT and the fact that most telesoftware needs to be re-written in a different language for the new computer, the system is proving faster and therefore friendlier.

ADP has some great plans for CompuNet, and some should come into effect before the end of 1987. Amiga users should soon be able to access CompuNet with of course, an Amiga modem.

C16 and C128 users will eventually be able to use a modem other than the black box. It is hoped that overseas users will be able to use PSX which would be a great help to those in Eur. There are even plans for non-CompuNet machines like the AtariST and IBM to access the system. It is all very exciting, so if you want to find out what the future holds, then join in and find out!

DISKET 8

Please refer to Listings before
typing in any programs.

PROGRAM: NEW CLINE BOOT

```

00 00 00-0000-00000000-0000
01 01 00000000-00000000-0000
02 02 00000000-00000000-0000
03 03 000000
04 04 000000-000000-0000-0000
05 05 000000-000000-0000-0000
06 06 000000-000000-0000-0000
07 07 000000-000000-0000-0000
08 08 000000-000000-0000-0000
09 09 000000-000000-0000-0000
10 10 000000-000000-0000-0000
11 11 000000-000000-0000-0000
12 12 000000-000000-0000-0000
13 13 000000-000000-0000-0000
14 14 000000-000000-0000-0000
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26 26 000000-000000-0000-0000
27 27 000000-000000-0000-0000
28 28 000000-000000-0000-0000
29 29 000000-000000-0000-0000
30 30 000000-000000-0000-0000
31 31 000000-000000-0000-0000
32 32 000000-000000-0000-0000
33 33 000000-000000-0000-0000
34 34 000000-000000-0000-0000
35 35 000000-000000-0000-0000
36 36 000000-000000-0000-0000
37 37 000000-000000-0000-0000
38 38 000000-000000-0000-0000
39 39 000000-000000-0000-0000
40 40 000000-000000-0000-0000
41 41 000000-000000-0000-0000
42 42 000000-000000-0000-0000
43 43 000000-000000-0000-0000
44 44 000000-000000-0000-0000
45 45 000000-000000-0000-0000
46 46 000000-000000-0000-0000
47 47 000000-000000-0000-0000
48 48 000000-000000-0000-0000
49 49 000000-000000-0000-0000
50 50 000000-000000-0000-0000
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67 67 000000-000000-0000-0000
68 68 000000-000000-0000-0000
69 69 000000-000000-0000-0000
70 70 000000-000000-0000-0000
71 71 000000-000000-0000-0000
72 72 000000-000000-0000-0000
73 73 000000-000000-0000-0000
74 74 000000-000000-0000-0000
75 75 000000-000000-0000-0000
76 76 000000-000000-0000-0000
77 77 000000-000000-0000-0000
78 78 000000-000000-0000-0000
79 79 000000-000000-0000-0000
80 80 000000-000000-0000-0000
81 81 000000-000000-0000-0000
82 82 000000-000000-0000-0000
83 83 000000-000000-0000-0000
84 84 000000-000000-0000-0000
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90 90 000000-000000-0000-0000
91 91 000000-000000-0000-0000
92 92 000000-000000-0000-0000
93 93 000000-000000-0000-0000
94 94 000000-000000-0000-0000
95 95 000000-000000-0000-0000
96 96 000000-000000-0000-0000
97 97 000000-000000-0000-0000
98 98 000000-000000-0000-0000
99 99 000000-000000-0000-0000

```


PROGRAM: ZEMORE.BAS

```

30 30 0-2049-1-1000
31 30 1-0
32 30 1-0
33 30 1-0
34 40 1-0
35 50 1-0
36 60 1-0
37 70 1-0
38 80 1-0
39 90 1-0
40 100 1-0
41 110 1-0
42 120 1-0
43 130 1-0
44 140 1-0
45 150 1-0
46 160 1-0
47 170 1-0
48 180 1-0
49 190 1-0
50 200 1-0
51 210 1-0
52 220 1-0
53 230 1-0
54 240 1-0
55 250 1-0
56 260 1-0
57 270 1-0
58 280 1-0
59 290 1-0
60 300 1-0
61 310 1-0
62 320 1-0
63 330 1-0
64 340 1-0
65 350 1-0
66 360 1-0
67 370 1-0
68 380 1-0
69 390 1-0
70 400 1-0
71 410 1-0
72 420 1-0
73 430 1-0
74 440 1-0
75 450 1-0
76 460 1-0
77 470 1-0
78 480 1-0
79 490 1-0
80 500 1-0
81 510 1-0
82 520 1-0
83 530 1-0
84 540 1-0
85 550 1-0
86 560 1-0
87 570 1-0
88 580 1-0
89 590 1-0
90 600 1-0
91 610 1-0
92 620 1-0
93 630 1-0
94 640 1-0
95 650 1-0
96 660 1-0
97 670 1-0
98 680 1-0
99 690 1-0
100 700 1-0
101 710 1-0
102 720 1-0
103 730 1-0
104 740 1-0
105 750 1-0
106 760 1-0
107 770 1-0
108 780 1-0
109 790 1-0
110 800 1-0
111 810 1-0
112 820 1-0
113 830 1-0
114 840 1-0
115 850 1-0
116 860 1-0
117 870 1-0
118 880 1-0
119 890 1-0
120 900 1-0
121 910 1-0
122 920 1-0
123 930 1-0
124 940 1-0
125 950 1-0
126 960 1-0
127 970 1-0
128 980 1-0
129 990 1-0
130 1000 1-0

```

LISTINGS

42	2102	045405	133.13	33.33	11.9
43	2103	045408	13.13	79.69	69.33
44	2104	045411	13.13	79.69	69.33
45	2105	045414	13.13	79.69	69.33
46	2106	045417	13.13	79.69	69.33
47	2107	045420	13.13	79.69	69.33
48	2108	045423	13.13	79.69	69.33
49	2109	045426	13.13	79.69	69.33
50	2110	045429	13.13	79.69	69.33
51	2111	045432	13.13	79.69	69.33
52	2112	045435	13.13	79.69	69.33
53	2113	045438	13.13	79.69	69.33
54	2114	045441	13.13	79.69	69.33
55	2115	045444	13.13	79.69	69.33
56	2116	045447	13.13	79.69	69.33
57	2117	045450	13.13	79.69	69.33
58	2118	045453	13.13	79.69	69.33
59	2119	045456	13.13	79.69	69.33
60	2120	045459	13.13	79.69	69.33
61	2121	045462	13.13	79.69	69.33
62	2122	045465	13.13	79.69	69.33
63	2123	045468	13.13	79.69	69.33
64	2124	045471	13.13	79.69	69.33
65	2125	045474	13.13	79.69	69.33
66	2126	045477	13.13	79.69	69.33
67	2127	045480	13.13	79.69	69.33
68	2128	045483	13.13	79.69	69.33
69	2129	045486	13.13	79.69	69.33
70	2130	045489	13.13	79.69	69.33
71	2131	045492	13.13	79.69	69.33
72	2132	045495	13.13	79.69	69.33
73	2133	045498	13.13	79.69	69.33
74	2134	045501	13.13	79.69	69.33
75	2135	045504	13.13	79.69	69.33
76	2136	045507	13.13	79.69	69.33
77	2137	045510	13.13	79.69	69.33
78	2138	045513	13.13	79.69	69.33
79	2139	045516	13.13	79.69	69.33
80	2140	045519	13.13	79.69	69.33
81	2141	045522	13.13	79.69	69.33
82	2142	045525	13.13	79.69	69.33
83	2143	045528	13.13	79.69	69.33
84	2144	045531	13.13	79.69	69.33
85	2145	045534	13.13	79.69	69.33
86	2146	045537	13.13	79.69	69.33
87	2147	045540	13.13	79.69	69.33
88	2148	045543	13.13	79.69	69.33
89	2149	045546	13.13	79.69	69.33
90	2150	045549	13.13	79.69	69.33
91	2151	045552	13.13	79.69	69.33
92	2152	045555	13.13	79.69	69.33
93	2153	045558	13.13	79.69	69.33
94	2154	045561	13.13	79.69	69.33
95	2155	045564	13.13	79.69	69.33
96	2156	045567	13.13	79.69	69.33
97	2157	045570	13.13	79.69	69.33
98	2158	045573	13.13	79.69	69.33
99	2159	045576	13.13	79.69	69.33
100	2160	045579	13.13	79.69	69.33

LISTINGS

5.31.2010

00 3040 data00,84.53,82.84,32.8

01 3045 data00,82.88,83.83,32.8

02 3050 data00,0.173,192.7,32.8

03 3055 data00,32.32,32.31,18

04 3060 data00,32.32,32.32,32

05 3065 data00,32.32,32.32,32

06 3070 data00,32.32,32.32,32

07 3075 data00,32.32,32.32,32

08 3080 data00,32.32,32.32,32

09 3085 data00,32.32,32.32,32

10 3090 data00,32.32,32.32,32

11 3095 data00,32.32,32.32,32

12 3100 data00,32.32,32.32,32

13 3105 data00,32.32,32.32,32

14 3110 data00,32.32,32.32,32

15 3115 data00,32.32,32.32,32

16 3120 data00,32.32,32.32,32

17 3125 data00,32.32,32.32,32

18 3130 data00,32.32,32.32,32

19 3135 data00,32.32,32.32,32

20 3140 data00,32.32,32.32,32

21 3145 data00,32.32,32.32,32

22 3150 data00,32.32,32.32,32

23 3155 data00,32.32,32.32,32

24 3160 data00,32.32,32.32,32

25 3165 data00,32.32,32.32,32

26 3170 data00,32.32,32.32,32

27 3175 data00,32.32,32.32,32

28 3180 data00,32.32,32.32,32

29 3185 data00,32.32,32.32,32

30 3190 data00,32.32,32.32,32

31 3195 data00,32.32,32.32,32

32 3200 data00,32.32,32.32,32

33 3205 data00,32.32,32.32,32

34 3210 data00,32.32,32.32,32

35 3215 data00,32.32,32.32,32

36 3220 data00,32.32,32.32,32

37 3225 data00,32.32,32.32,32

38 3230 data00,32.32,32.32,32

39 3235 data00,32.32,32.32,32

40 3240 data00,32.32,32.32,32

41 3245 data00,32.32,32.32,32

42 3250 data00,32.32,32.32,32

43 3255 data00,32.32,32.32,32

44 3260 data00,32.32,32.32,32

45 3265 data00,32.32,32.32,32

46 3270 data00,32.32,32.32,32

47 3275 data00,32.32,32.32,32

48 3280 data00,32.32,32.32,32

49 3285 data00,32.32,32.32,32

50 3290 data00,32.32,32.32,32

51 3295 data00,32.32,32.32,32

52 3300 data00,32.32,32.32,32

53 3305 data00,32.32,32.32,32

54 3310 data00,32.32,32.32,32

55 3315 data00,32.32,32.32,32

56 3320 data00,32.32,32.32,32

57 3325 data00,32.32,32.32,32

58 3330 data00,32.32,32.32,32

59 3335 data00,32.32,32.32,32

60 3340 data00,32.32,32.32,32

C1 40 MDP AIRCRAFT SPINETS

01 50 MDP BASIC DATA LIBRARY

02 60 MDP SPINETS DIVISION BY

03 70 MDP RISK MDP

04 80 MDP

05 90 MDP

10 00 EL-205 129-180 (100-2024

06 100 MDP L-O TO EL (100-2024

11 110 MDP S, (P) AIRCRAFT SPINETS

12 120 MDP CO-COAL-PURE EL-205-18-6

13 130 MDP S, (P) RACE TRANSMIT

14 140 MDP (100-2024)

15 150 MDP (100-2024)

16 160 MDP (100-2024)

17 170 MDP (100-2024)

18 180 MDP (100-2024)

19 190 MDP (100-2024)

20 200 MDP (100-2024)

21 210 MDP (100-2024)

22 220 MDP (100-2024)

23 230 MDP (100-2024)

24 240 MDP (100-2024)

25 250 MDP (100-2024)

26 260 MDP (100-2024)

27 270 MDP (100-2024)

28 280 MDP (100-2024)

29 290 MDP (100-2024)

30 300 MDP (100-2024)

31 310 MDP (100-2024)

32 320 MDP (100-2024)

33 330 MDP (100-2024)

34 340 MDP (100-2024)

35 350 MDP (100-2024)

36 360 MDP (100-2024)

37 370 MDP (100-2024)

38 380 MDP (100-2024)

39 390 MDP (100-2024)

40 400 MDP (100-2024)

41 410 MDP (100-2024)

42 420 MDP (100-2024)

43 430 MDP (100-2024)

44 440 MDP (100-2024)

45 450 MDP (100-2024)

46 460 MDP (100-2024)

47 470 MDP (100-2024)

48 480 MDP (100-2024)

49 490 MDP (100-2024)

50 500 MDP (100-2024)

51 510 MDP (100-2024)

52 520 MDP (100-2024)

53 530 MDP (100-2024)

54 540 MDP (100-2024)

55 550 MDP (100-2024)

56 560 MDP (100-2024)

57 570 MDP (100-2024)

58 580 MDP (100-2024)

59 590 MDP (100-2024)

60 600 MDP (100-2024)

35 440 DATA 0.0,0.0,0.0,0.0,0.0

36 450 DATA 0.0,0.0,0.0,0.0,0.0

37 460 DATA 0.0,0.0,0.0,0.0,0.0

38 470 DATA 0.0,0.0,0.0,0.0,0.0

39 480 DATA 0.0,0.0,0.0,0.0,0.0

40 490 DATA 0.0,0.0,0.0,0.0,0.0

41 500 DATA 0.0,0.0,0.0,0.0,0.0

42 510 DATA 0.0,0.0,0.0,0.0,0.0

43 520 DATA 0.0,0.0,0.0,0.0,0.0

44 530 DATA 0.0,0.0,0.0,0.0,0.0

45 540 DATA 0.0,0.0,0.0,0.0,0.0

46 550 DATA 0.0,0.0,0.0,0.0,0.0

47 560 DATA 0.0,0.0,0.0,0.0,0.0

48 570 DATA 0.0,0.0,0.0,0.0,0.0

49 580 DATA 0.0,0.0,0.0,0.0,0.0

50 590 DATA 0.0,0.0,0.0,0.0,0.0

51 600 DATA 0.0,0.0,0.0,0.0,0.0

52 610 DATA 0.0,0.0,0.0,0.0,0.0

53 620 DATA 0.0,0.0,0.0,0.0,0.0

54 630 DATA 0.0,0.0,0.0,0.0,0.0

55 640 DATA 0.0,0.0,0.0,0.0,0.0

56 650 DATA 0.0,0.0,0.0,0.0,0.0

57 660 DATA 0.0,0.0,0.0,0.0,0.0

58 670 DATA 0.0,0.0,0.0,0.0,0.0

59 680 DATA 0.0,0.0,0.0,0.0,0.0

60 690 DATA 0.0,0.0,0.0,0.0,0.0

70 700 DATA 0.0,0.0,0.0,0.0,0.0

71 710 DATA 0.0,0.0,0.0,0.0,0.0

72 720 DATA 0.0,0.0,0.0,0.0,0.0

73 730 DATA 0.0,0.0,0.0,0.0,0.0

74 740 DATA 0.0,0.0,0.0,0.0,0.0

75 750 DATA 0.0,0.0,0.0,0.0,0.0

76 760 DATA 0.0,0.0,0.0,0.0,0.0

77 770 DATA 0.0,0.0,0.0,0.0,0.0

78 780 DATA 0.0,0.0,0.0,0.0,0.0

79 790 DATA 0.0,0.0,0.0,0.0,0.0

80 800 DATA 0.0,0.0,0.0,0.0,0.0

81 810 DATA 0.0,0.0,0.0,0.0,0.0

82 820 DATA 0.0,0.0,0.0,0.0,0.0

83 830 DATA 0.0,0.0,0.0,0.0,0.0

84 840 DATA 0.0,0.0,0.0,0.0,0.0

85 850 DATA 0.0,0.0,0.0,0.0,0.0

86 860 DATA 0.0,0.0,0.0,0.0,0.0

87 870 DATA 0.0,0.0,0.0,0.0,0.0

88 880 DATA 0.0,0.0,0.0,0.0,0.0

89 890 DATA 0.0,0.0,0.0,0.0,0.0

90 900 DATA 0.0,0.0,0.0,0.0,0.0

PROGRAM: AIRCRAFT DATA

61 10 MDP

62 20 MDP

63 30 MDP

64 40 MDP

LISTINGS

```

4 8 8 127 0 0 43 0 0 0 15 644
E3 2692 DATA 0 0 7 0 0 0 0 0 0 0
0 0 0 0 0 43 0 0 0 0 0 0 0
3A 1470 DATA 52 0 0 49 0 0 0 270
262 0 48 0 0 46 0 0 0 275 978
E9 2080 DATA 0 0 254 0 0 285 12
0 0 270 282 0 48 168 0 48 14
4 1488
4B 2040 DATA 0 48 72 0 48 88 0
65 124 0 155 180 128 205 18
0 0 1777
F4 2020 DATA 258 320 0 255 248
0 0 0 0 0 2 85 0 285 128 0 0 0
4 464
64 2320 DATA 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 1 0 0
72 2348 DATA 0 1 0 0 0 125 0 15 0
95 0 63 250 0 8 250 250 0 250
1265
1A 2020 DATA 288 0 0 0 0 0 0 0 0
0 0 0 0 0 31 0 0 15 30
4B 2460 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 91 84
4C 2070 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0
6A 2460 DATA 0 0 0 0 1 188 0 200 0
64 0 125 248 0 250 254 0 250
250 254
6C 2080 DATA 136 240 0 0 64 0 0
180 0 0 148 0 0 204 0 0 0 0 778
F9 2180 DATA 782 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 91 388
67 2310 DATA 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0
61 2220 DATA 90 320 0 63 288 0
127 285 0 127 250 0 125 250
0 250 2041
E7 2120 DATA 250 0 0 0 0 0 0 0 0
0 0 0 0 0 31 0 18 308
59 2148 DATA 0 0 7 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
70 2154 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
8B 2182 DATA 0 0 18 234 0 127 3
48 0 288 284 0 250 240 0 250
0 1878
91 2170 DATA 0 240 0 0 234 0 0 0
0 0 0 204 0 0 234 0 0 0 0 0
40 2188 DATA 254 0 0 234 0 0 0 0
0 0 0 0 0 0 0 0 184 630
C7 2190 DATA 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0
84 2205 DATA 0 0 0 238 285 0 25
0 285 0 127 250 0 63 250 0 0
5 1260
75 2218 DATA 285 0 31 285 0 18
252 0 0 0 0 0 0 0 0 0 0 0 0
47 2228 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
80 2238 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
8C 2242 DATA 0 0 0 285 284 0 250
284 0 248 284 0 285 248 0 25
0 128 2418
8E 2250 DATA 0 240 0 0 112 0 0 0
78 0 0 124 0 0 248 0 0 274
43 2260 DATA 248 0 0 84 0 0 0 0
0 0 0 0 0 0 0 80 360
77 2270 DATA 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 1 0 0 0
43 2280 DATA 0 3 358 250 250 12
7 285 285 31 250 250 12 250
250 15 250 278
95 2290 DATA 285 7 285 285 7 35
0 252 7 284 0 0 0 0 0 0 0 0
73 2300 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 184
90 2310 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0
9C 2320 DATA 0 0 285 285 284 25

```

```

0 0 0 0 7 234 0 0 248
39 2330 DATA 282 0 1 250 128 1
258 240 0 285 244 0 63 250 0
0 31 1878
6B 2340 DATA 250 0 7 288 0 7 28
5 0 1 250 0 0 43 0 0 7 1180
C3 2350 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
C5 2310 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
13 2320 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 200 0 0 248 0 464
C4 2338 DATA 0 285 0 0 270 0 0
288 182 0 275 248 0 250 282
0 1278
44 2370 DATA 288 285 0 127 250
282 128 18 248 0 0 252 0 0 0
0 0 1272

```

PROGRAM: AIRCRAFT DISPLAY

```

88 10 rear *****
****
C0 20 rear marine library 81air
88
e3 30 rear aircraft
****
e6 40 rear *****
****
8c 50 subr00 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0
8a 50 subr01 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0
0E 2020 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
8C 2440 DATA 0 25 0 0 0 275 0 18
270 0 127 250 0 250 285 64 0
50 1778
C7 2480 DATA 284 63 285 248 31
285 248 0 250 240 0 254 0 0
0 0 1271
96 2400 DATA 0 0 1 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 180
61 2478 DATA 0 0 284 0 15 240 1
285 143 31 254 0 250 248 0
250 250
25 2480 DATA 182 0 285 0 0 248
0 0 0 224 0 0 224 0 0 18 0 112
4
84 2400 DATA 0 13 0 0 124 0 0 0
48 0 0 200 0 0 182 0 0 778
9B 2580 DATA 64 0 0 128 0 8 0 0
0 0 0 0 0 0 0 0 0 0 0
C3 2620 DATA 0 0 1 0 0 0 1 0 0 0
0 0 0 1 250 250 250 127 288
AC 2520 DATA 288 288 31 285 285
28 285 285 25 250 275 7 250
250 7 250 2888
06 2580 DATA 252 7 284 0 4 0 0
0 0 0 0 0 0 0 0 0 0 0 0
63 2648 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 1 91 93
38 2574 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 250 250 284 282 1214
48 2620 DATA 288 248 285 285 0
258 248 0 275 128 0 252 0 0
74 0 2527
40 2670 DATA 0 34 0 0 34 0 0 34
0 0 120 0 0 184 0 0 348
81 2680 DATA 112 0 0 48 0 8 80
0 0 148 0 0 48 0 0 1 40 288
08 2690 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 10 0 0 7 22
F2 2680 DATA 224 0 0 270 0 1 25
0 128 1 285 248 0 250 254 0
63 7781
F8 2818 DATA 288 0 31 285 0 7 0
64 8 7 288 0 1 285 0 0 33 23
84
64 3218 DATA 0 0 40 0 0 34 0 0
28 0 0 54 0 0 0 0 0 172
83 2820 DATA 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
84 2840 DATA 0 0 0 0 0 0 0 0 0 0
0 0 18 0 234 0 272
FC 2850 DATA 0 248 0 0 250 128
0 285 248 0 250 254 0 250 250
0 127 2717
80 2860 DATA 0 25 248 0 0 31 0 0
0 0 0 0 0 0 0 0 0 0 0
38 2870 DATA 0 0 0 0 0 0 0 0 0 0

```

PROGRAM: BOB LOOPER 2

```

a4 10 rear *****
****
F4 20 rear adventure hit 8air3
****
3e 30 rear object module
****
48 rear *****
****
8e 2048 For info:00 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0
82 2238 random data 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0
8e 2020 back listed
78 2040 data 78 33 182 76 66 182
78 66 182 76 104 102 76 248
182 76 66 2040
40 2020 8air001 283 74 201 185
78 33 182 76 66 184 76 66 18
14 18 182
8a 2048 8air02 32 127 184 141 78

```



```

48 .....?
49 830 app 878 718.88.2.088.18
50 840 app 88
51 850 data 32.212.228.32.263.1
   38.73.188.178.32.247.183.183
   38.73.188.178.32.247.183.183
52 860 app 878 718.88.2.088.18
   47.183.183.3.41.284.153.12.6
   8.20.184.21.184.153.21
53 878 data 178.178.178.178.20.3
   2.93.223.183.2.8.2.233.1.94

```

PROGRAM: NEW DEMO 3

```

85 10 app.....?
86 20 app? app? 801 801 3 4
87 30 app? 801 801 3 4
88 40 app? 801 801 3 4
89 50 app? 801 801 3 4
90 60 app? 801 801 3 4
91 70 app? 801 801 3 4
92 80 app? 801 801 3 4
93 90 app? 801 801 3 4
94 100 app? 801 801 3 4
95 110 app? 801 801 3 4
96 120 app? 801 801 3 4
97 130 app? 801 801 3 4
98 140 app? 801 801 3 4
99 150 app? 801 801 3 4
100 160 app? 801 801 3 4
101 170 app? 801 801 3 4
102 180 app? 801 801 3 4
103 190 app? 801 801 3 4
104 200 app? 801 801 3 4
105 210 app? 801 801 3 4
106 220 app? 801 801 3 4
107 230 app? 801 801 3 4
108 240 app? 801 801 3 4
109 250 app? 801 801 3 4
110 260 app? 801 801 3 4
111 270 app? 801 801 3 4
112 280 app? 801 801 3 4
113 290 app? 801 801 3 4
114 300 app? 801 801 3 4
115 310 app? 801 801 3 4
116 320 app? 801 801 3 4
117 330 app? 801 801 3 4
118 340 app? 801 801 3 4
119 350 app? 801 801 3 4
120 360 app? 801 801 3 4
121 370 app? 801 801 3 4
122 380 app? 801 801 3 4
123 390 app? 801 801 3 4
124 400 app? 801 801 3 4
125 410 app? 801 801 3 4
126 420 app? 801 801 3 4
127 430 app? 801 801 3 4
128 440 app? 801 801 3 4
129 450 app? 801 801 3 4
130 460 app? 801 801 3 4
131 470 app? 801 801 3 4
132 480 app? 801 801 3 4
133 490 app? 801 801 3 4
134 500 app? 801 801 3 4
135 510 app? 801 801 3 4
136 520 app? 801 801 3 4
137 530 app? 801 801 3 4
138 540 app? 801 801 3 4
139 550 app? 801 801 3 4
140 560 app? 801 801 3 4
141 570 app? 801 801 3 4
142 580 app? 801 801 3 4
143 590 app? 801 801 3 4
144 600 app? 801 801 3 4
145 610 app? 801 801 3 4
146 620 app? 801 801 3 4
147 630 app? 801 801 3 4
148 640 app? 801 801 3 4
149 650 app? 801 801 3 4
150 660 app? 801 801 3 4
151 670 app? 801 801 3 4
152 680 app? 801 801 3 4
153 690 app? 801 801 3 4
154 700 app? 801 801 3 4
155 710 app? 801 801 3 4
156 720 app? 801 801 3 4
157 730 app? 801 801 3 4
158 740 app? 801 801 3 4
159 750 app? 801 801 3 4
160 760 app? 801 801 3 4
161 770 app? 801 801 3 4
162 780 app? 801 801 3 4
163 790 app? 801 801 3 4
164 800 app? 801 801 3 4
165 810 app? 801 801 3 4
166 820 app? 801 801 3 4
167 830 app? 801 801 3 4
168 840 app? 801 801 3 4
169 850 app? 801 801 3 4
170 860 app? 801 801 3 4
171 870 app? 801 801 3 4
172 880 app? 801 801 3 4
173 890 app? 801 801 3 4
174 900 app? 801 801 3 4
175 910 app? 801 801 3 4
176 920 app? 801 801 3 4
177 930 app? 801 801 3 4
178 940 app? 801 801 3 4
179 950 app? 801 801 3 4
180 960 app? 801 801 3 4
181 970 app? 801 801 3 4
182 980 app? 801 801 3 4
183 990 app? 801 801 3 4

```

PROGRAM: 3 WAY SCHOOL BAS

```

85 3 data 178.178.178.178.20.3
   2.93.223.183.2.8.2.233.1.94
86 3 data 178.178.178.178.20.3
   2.93.223.183.2.8.2.233.1.94
87 3 data 178.178.178.178.20.3
   2.93.223.183.2.8.2.233.1.94
88 3 data 41.127.141.127.200.189

```

```

.....?
99 4 data 2.231.9.3.040.2.231.3
   78.0.231.41
100 5 data 252.9.3.142.8.232.573
   14.232.41.284
101 6 data 141.14.232.88.189.8.1
   15.30.208.240.33
102 7 data 232.189.0.141.232.189
   208.232.141.231.189
103 8 data 85.173.232.240.80
   201.3.208.8.32
104 9 data 232.189.78.173.232.201
   1.2.232.8.32.232
105 10 data 183.78.173.183.231.3
   208.8.32.71.231
106 11 data 78.173.232.201.4.232
   1.2.232.232.78
107 12 data 173.183.261.8.208.9
   22.232.183.32.189
108 13 data 183.78.173.232.201.3
   208.7.22.128.183
109 14 data 12.71.183.78.173.232
   231.7.232.9.32
110 15 data 100.183.12.27.183.78
   173.183.232.8.27.183.78
111 16 data 8.32.189.183.32.71.1
   83.189.181.141.28
112 17 data 3.189.173.243.21.2.1
   71.232.183.141.18
113 18 data 208.78.28.183.268.8
   141.232.208.183.23
114 19 data 141.13.208.189.24.24
   1.24.208.208.237.141
115 20 data 28.3.248.282.141.20
   3.189.7.141.32
116 21 data 288.32.183.189.8
   141.32.208.189.252
117 22 data 141.18.208.78.28.183
   173.232.208.42.8
118 23 data 8.34.13.232.183.141
   22.208.178.19.232
119 24 data 41.248.13.232.183.141
   1.17.232.189.28.241
120 25 data 24.208.189.8.141.32
   208.32.173.183.189
121 26 data 8.343.32.208.78.78.3
   92.189.1.141.28
122 27 data 208.204.248.244.170
   204.84.178.22.208.9
123 28 data 248.24.183.232.183.4
   1.7.241.232.183.244
124 29 data 17.88.173.208.183.23
   2.1.141.208.183.173
125 30 data 231.183.232.8.140.23
   1.183.78.173.22.208
126 31 data 42.7.84.237.189.183
   42.7.84.238.189
127 32 data 126.17.32.173.232.18
   3.232.1.141.232.183
128 33 data 173.231.183.183.0.14
   1.231.183.88.173.37
129 34 data 208.8.248.24.108.204
   183.42.7.181.232
130 35 data 173.183.17.32.173.23
   0.189.237.248.241.232
131 36 data 183.173.231.183.232
   0.141.232.248.84.173
132 37 data 17.248.47.8.85.237.8
   34.237.41.7.140
133 38 data 232.183.178.17.24.17
   3.232.183.183.248.140
134 39 data 232.183.178.178.232.183
   183.0.141.231.183.88
135 40 data 189.0.132.232.183.73
   132.234.173.232.593
136 41 data 132.251.173.231.183
   593.252.182.18.208.8
137 42 data 173.251.148.232.208
   183.40.208.247.183.232
138 43 data 28.183.248.183.252.3
   44.2.232.252.183.23
139 44 data 24.183.48.123.232.14

```

```

4.2.232.234.232.208
45 data 228.88.0.138.189.1.1
   1.8.0.0
46 46 data 8.173.8.232.248.8.88
   2.0.74.178.1
47 47 data 134.74.178.1.280.74
   178.1.280.74.178
48 48 data 1.232.74.143.237.183
   148.238.233.84.73
49 49 data 240.183.184.237.183
   173.238.183.183.208.7
50 50 data 183.268.4.141.238.18
   3.84.234.8.208.20
51 51 data 183.252.208.0.189.2
   140.183.183.88.232
52 52 data 1.232.8.189.1.141.23
   8.183.84.183.8
53 53 data 240.183.184.237.183
   183.0.141.237.183
54 54 data 232.232.1.208.8.248.3
   141.238.183.94
55 55 data 183.238.208.23.234.1
   208.4.189.0.141
56 56 data 232.183.84.234.232.3
   88.237.248.7.141.238
57 57 data 183.84.183.1.248.18
   234.1.248.8.183
58 58 data 0.141.238.183.84.232
   232.248.1.248.8
59 59 data 141.232.183.183.0.1
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PROGRAM: 4 WAY SCHOOL BC

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LISTINGS

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4170 1 - SERIAL DOWN & RIGHT
4180 2 - SERIAL DOWN & LEFT
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SYNTAX INTO THE 4800

```

10      ORG 40100
20      ;
30      SCREENMEM EQU 251
40      SCREENCOL EQU 253
50      ;
60      GETIN     EQU $FFE4
70      ;
80      ;
90      ;INITIATE SCREEN AND COLOUR VARS.
100     ;
110     LDA #<1024
120     STA <SCREENMEM
130     LDA #>1024
140     STA >SCREENMEM
150     ;
160     LDA #<55206
170     STA <SCREENCOL
180     LDA #>55206
190     STA >SCREENCOL
200     ;
210     ;CLEAR THE SCREEN.
220     ;
230     ;
240     JSR $E544
250     ;
260     ;SWITCH COMPUTER INTO
270     ;BUSINESS MODE.
280     ;
290     LDA #14
300     JSR $E716
310     ;
320     ;WAIT FOR KEYPRESS.
330     GETKEY   JSR GETIN
340             BEQ GETKEY
350     ;
360     ;IF F1 PRESSED, EXIT.
370     ;
380     CMP #133
390     BEQ EXIT
400     ;
410     ;IF DELETE KEY HAS BEEN PRESSED,
420     ;JUMP TO DELETION ROUTINE.
430     ;
440     CMP #20
450     BEQ DELETE
460     ;
470     ;CONVERT ASCII INTO SCREEN CODE.
480     ;
490     CMP #128
500     BCC SKIP
510     SEC ;UPPER CASE
520     BCC #64
530     SKIP    CMP #64 ;LOWER CASE
540     BCC PRINT
550     SEC

```

LISTINGS

```

580          SSC #64
590          :
600          :PRINT CHARACTER ONTO SCREEN.
610          :
620          PRINT      LBY #0
630          STA (SCREENEM),Y
640          LDA #6
650          STA (SCREENCOL),Y
660          :ADVANCE TO NEXT PRINT POSITION.
670          :
680          :      INC <SCREENEM
690          :      SKE NORIGH
700          :      INC <SCREENEM
710          NORIGH     INC <SCREENCOL
720          SKE GETKEY
730          INC <SCREENCOL
740          SKE GETKEY
750          :
760          :
770          :
780          :DELETION ROUTINE:
790          :
800          : IF END OF SCREEN, KILL
810          :
820          DELETE    LDA #<1004
830          CMP <SCREENEM
840          BNE DELETE1
590          :
600          :      LDA <1004
610          :      CMP <SCREENEM
620          :      BNE GETKEY
630          :
640          :      LDA <SCREENEM
650          :      SKE NORIGH
660          :      DEC <SCREENEM
670          :
680          :      LDA <SCREENCOL
690          :      SKE NORIGH
700          :      DEC <SCREENCOL
710          :
720          :      LDA #<1004
730          :      AND PRINT SPACE OVER LETTER.
740          :
750          :
760          :      LBY #0
770          :      LDA #33          (SPACE)
780          :      STA (SCREENEM),Y
790          :      LDA #6          (BLINK)
800          :      STA (SCREENCOL),Y
810          :
820          :      JMP GETKEY
830          :
840          :      KILL: RETURN TO BASIC
850          :
860          :      KILL     RTS
    
```

```

PROGRAM: BUD FOR CREATE
00 10 END CREATE BUDGET SUBJECT
01 0
02 30 DIM A(100), B(100), C(100)
03 30 DIM S, S2, "NO-BUDGET BUDG
04 S, S2
05 30 NEXT S
06 30 DIM A(100), B(100), C(100)
07 30 PRINT S, B(100)
08 30 PRINT S, B(100)
09 300 NEXT S
10 100 CLOSE
    
```

```

PROGRAM: BUD DATA CREATE
00 10 DIM A(100), B(100)
01 30 DIM S, S2, "NO-BUDGET BUDG
02 S, S2
03 30 NEXT S
04 30 DIM A(100), B(100), C(100)
05 30 PRINT S, B(100)
06 30 NEXT S
07 300 NEXT S
08 300 NEXT S
09 300 NEXT S
10 300 NEXT S
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100 300 NEXT S
    
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PROGRAM: BUD DATA CREATE
10 30 DIM A(100), B(100)
11 30 DIM S, S2, "NO-BUDGET BUDG
12 S, S2
13 30 NEXT S
14 30 DIM A(100), B(100), C(100)
15 30 PRINT S, B(100)
16 30 NEXT S
17 300 NEXT S
18 300 NEXT S
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00 30 FOR A=1 TO 100
01 30 300 NEXT A
02 30 300 NEXT A
03 30 300 NEXT A
04 30 300 NEXT A
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100 30 300 NEXT A
    
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PROGRAM: BUDGET CRIC
01 300 NEXT
02 310 END * BUDGET CRIC BY S
03 PHILLIPS
04 300 NEXT
05 300 NEXT
06 300 NEXT
07 300 NEXT
08 300 NEXT
09 300 NEXT
10 300 NEXT
11 300 NEXT
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LISTINGS

31	1590	IFP+100P+2100P+2000P+20	37	2080	000000000000000000000000	63	2520	PRINT"BI00T2,SL,CPO,SS
		00P+000P+1100P+2000P+1100P						..SL,CPO,SS,SL,CPO,SS,SL,CPO,
32	1595	14100P+14100P+1400	38	2090	CE-S-CDE" ; 00T01000			SS,SVSON,SL,CPO,SS,SVSON"
33	1600	11100P+10100P+1000	39	2100	FT+P;00+S;00+S;00+S;00+S	64	2510	FORC0+110000+00T02
34	1605	11100P+10100P+1000	40	2110	FT+P;00+S;00+S;00+S;00+S	65	2520	00T0200
35	1610	11100P+10100P+1000	41	2120	FT+P;00+S;00+S;00+S;00+S	66	2530	00T0200
36	1615	11100P+10100P+1000	42	2130	FT+P;00+S;00+S;00+S;00+S	67	2540	00T0200
37	1620	11100P+10100P+1000	43	2140	FT+P;00+S;00+S;00+S;00+S	68	2550	00T0200
38	1625	11100P+10100P+1000	44	2150	FT+P;00+S;00+S;00+S;00+S	69	2560	00T0200
39	1630	11100P+10100P+1000	45	2160	FT+P;00+S;00+S;00+S;00+S	70	2570	00T0200
40	1635	11100P+10100P+1000	46	2170	FT+P;00+S;00+S;00+S;00+S	71	2580	00T0200
41	1640	11100P+10100P+1000	47	2180	FT+P;00+S;00+S;00+S;00+S	72	2590	00T0200
42	1645	11100P+10100P+1000	48	2190	FT+P;00+S;00+S;00+S;00+S	73	2600	00T0200
43	1650	11100P+10100P+1000	49	2200	FT+P;00+S;00+S;00+S;00+S	74	2610	00T0200
44	1655	11100P+10100P+1000	50	2210	FT+P;00+S;00+S;00+S;00+S	75	2620	00T0200
45	1660	11100P+10100P+1000						
46	1665	11100P+10100P+1000						
47	1670	11100P+10100P+1000						
48	1675	11100P+10100P+1000						
49	1680	11100P+10100P+1000						
50	1685	11100P+10100P+1000						
51	1690	11100P+10100P+1000						
52	1695	11100P+10100P+1000						
53	1700	11100P+10100P+1000						
54	1705	11100P+10100P+1000						
55	1710	11100P+10100P+1000						
56	1715	11100P+10100P+1000						
57	1720	11100P+10100P+1000						
58	1725	11100P+10100P+1000						
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71	1790	11100P+10100P+1000						
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73	1800	11100P+10100P+1000						
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88	1875	11100P+10100P+1000						
89	1880	11100P+10100P+1000						
90	1885	11100P+10100P+1000						
91	1890	11100P+10100P+1000						
92	1895	11100P+10100P+1000						
93	1900	11100P+10100P+1000						
94	1905	11100P+10100P+1000						
95	1910	11100P+10100P+1000						
96	1915	11100P+10100P+1000						
97	1920	11100P+10100P+1000						
98	1925	11100P+10100P+1000						
99	1930	11100P+10100P+1000						
100	1935	11100P+10100P+1000						

LISTINGS

80	2680 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	64	3270 ST(11+0012) : (STR11) : 0000 20	78	3740 PR18742.8(1TY) 0000
81	2690 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	65	3280 ST(12+0013) : (STR12) : 0000 30	79	3750 PR18742.8(1TY) 0000
82	2700 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	66	3290 ST(13+0014) : (STR13) : 0000 30	80	3760 PR18742.8(1TY) 0000
83	2710 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	67	3300 ST(14+0015) : (STR14) : 0000 30	81	3770 PR18742.8(1TY) 0000
84	2720 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	68	3310 ST(15+0016) : (STR15) : 0000 30	82	3780 PR18742.8(1TY) 0000
85	2730 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	69	3320 ST(16+0017) : (STR16) : 0000 30	83	3790 PR18742.8(1TY) 0000
86	2740 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	70	3330 ST(17+0018) : (STR17) : 0000 30	84	3800 PR18742.8(1TY) 0000
87	2750 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	71	3340 ST(18+0019) : (STR18) : 0000 30	85	3810 PR18742.8(1TY) 0000
88	2760 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	72	3350 ST(19+0020) : (STR19) : 0000 30	86	3820 PR18742.8(1TY) 0000
89	2770 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	73	3360 ST(20+0021) : (STR20) : 0000 30	87	3830 PR18742.8(1TY) 0000
90	2780 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	74	3370 ST(21+0022) : (STR21) : 0000 30	88	3840 PR18742.8(1TY) 0000
91	2790 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	75	3380 ST(22+0023) : (STR22) : 0000 30	89	3850 PR18742.8(1TY) 0000
92	2800 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	76	3390 ST(23+0024) : (STR23) : 0000 30	90	3860 PR18742.8(1TY) 0000
93	2810 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	77	3400 ST(24+0025) : (STR24) : 0000 30	91	3870 PR18742.8(1TY) 0000
94	2820 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	78	3410 ST(25+0026) : (STR25) : 0000 30	92	3880 PR18742.8(1TY) 0000
95	2830 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	79	3420 ST(26+0027) : (STR26) : 0000 30	93	3890 PR18742.8(1TY) 0000
96	2840 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	80	3430 ST(27+0028) : (STR27) : 0000 30	94	3900 PR18742.8(1TY) 0000
97	2850 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	81	3440 ST(28+0029) : (STR28) : 0000 30	95	3910 PR18742.8(1TY) 0000
98	2860 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	82	3450 ST(29+0030) : (STR29) : 0000 30	96	3920 PR18742.8(1TY) 0000
99	2870 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	83	3460 ST(30+0031) : (STR30) : 0000 30	97	3930 PR18742.8(1TY) 0000
00	2880 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	84	3470 ST(31+0032) : (STR31) : 0000 30	98	3940 PR18742.8(1TY) 0000
01	2890 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	85	3480 ST(32+0033) : (STR32) : 0000 30	99	3950 PR18742.8(1TY) 0000
02	2900 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	86	3490 ST(33+0034) : (STR33) : 0000 30	00	3960 PR18742.8(1TY) 0000
03	2910 L-LSR(1004T) : (FL+TRMR) TRMT+ (1100T)000+000(T) : 000000	87	3500 ST(34+0035) : (STR34) : 0000 30		

PROGRAM INDEX REVIEW

48	100 SCOTLAND
67	110 HINDI S.L.T. BUDGET DATA S.L.T.
80	120 PORTS-070400
87	130 IMPU400.8(1TY)
88	140 IMPU42.8(1TY)
91	150 HECTY
89	160 PORTS-170100
90	170 IMPU400.8(1TY)
92	180 IMPU42.8(1TY)
93	190 HECTY
94	200 PORTS-10020
95	210 IMPU400.8(1TY)
96	220 IMPU42.8(1TY)
97	230 PORTS-10040
98	240 IMPU400.8(1TY)
99	250 IMPU42.8(1TY)
00	260 HECTY
01	270 PORTS-170100
02	280 IMPU400.8(1TY)
03	290 IMPU42.8(1TY)
04	300 HECTY
05	310 PORTS-10040
06	320 IMPU400.8(1TY)
07	330 IMPU42.8(1TY)
08	340 HECTY
09	350 PORTS-170100
10	360 IMPU400.8(1TY)
11	370 IMPU42.8(1TY)
12	380 HECTY
13	390 PORTS-10040
14	400 IMPU400.8(1TY)
15	410 IMPU42.8(1TY)
16	420 HECTY
17	430 PORTS-170100
18	440 IMPU400.8(1TY)
19	450 IMPU42.8(1TY)
20	460 HECTY
21	470 PORTS-10040
22	480 IMPU400.8(1TY)
23	490 IMPU42.8(1TY)
24	500 HECTY
25	510 PORTS-170100
26	520 IMPU400.8(1TY)
27	530 IMPU42.8(1TY)
28	540 HECTY
29	550 PORTS-10040
30	560 IMPU400.8(1TY)
31	570 IMPU42.8(1TY)
32	580 HECTY
33	590 PORTS-170100
34	600 IMPU400.8(1TY)
35	610 IMPU42.8(1TY)
36	620 HECTY
37	630 PORTS-10040
38	640 IMPU400.8(1TY)
39	650 IMPU42.8(1TY)
40	660 HECTY
41	670 PORTS-170100
42	680 IMPU400.8(1TY)
43	690 IMPU42.8(1TY)
44	700 HECTY
45	710 PORTS-10040
46	720 IMPU400.8(1TY)
47	730 IMPU42.8(1TY)
48	740 HECTY
49	750 PORTS-170100
50	760 IMPU400.8(1TY)
51	770 IMPU42.8(1TY)
52	780 HECTY
53	790 PORTS-10040
54	800 IMPU400.8(1TY)
55	810 IMPU42.8(1TY)
56	820 HECTY
57	830 PORTS-170100
58	840 IMPU400.8(1TY)
59	850 IMPU42.8(1TY)
60	860 HECTY
61	870 PORTS-10040
62	880 IMPU400.8(1TY)
63	890 IMPU42.8(1TY)
64	900 HECTY
65	910 PORTS-170100
66	920 IMPU400.8(1TY)
67	930 IMPU42.8(1TY)
68	940 HECTY
69	950 PORTS-10040
70	960 IMPU400.8(1TY)
71	970 IMPU42.8(1TY)
72	980 HECTY
73	990 PORTS-170100
74	1000 IMPU400.8(1TY)
75	1010 IMPU42.8(1TY)
76	1020 HECTY
77	1030 PORTS-10040
78	1040 IMPU400.8(1TY)
79	1050 IMPU42.8(1TY)
80	1060 HECTY
81	1070 PORTS-170100
82	1080 IMPU400.8(1TY)
83	1090 IMPU42.8(1TY)
84	1100 HECTY
85	1110 PORTS-10040
86	1120 IMPU400.8(1TY)
87	1130 IMPU42.8(1TY)
88	1140 HECTY
89	1150 PORTS-170100
90	1160 IMPU400.8(1TY)
91	1170 IMPU42.8(1TY)
92	1180 HECTY
93	1190 PORTS-10040
94	1200 IMPU400.8(1TY)
95	1210 IMPU42.8(1TY)
96	1220 HECTY
97	1230 PORTS-170100
98	1240 IMPU400.8(1TY)
99	1250 IMPU42.8(1TY)
00	1260 HECTY

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An Assign of your own

Thank you to all our readers who completed and returned the Reader Survey forms that went out with our September issue.

We are in the process of evaluating your views at this moment and you will no doubt see one or two tweaks to the contents of the magazine so that it gives you even more of what you want to read.

The draw for the winner of the Assign that we were giving away has been made and the lucky person is Hugh McChor of Sheffield.

Our congratulations to Hugh, and I hope that you enjoy using your new computer.

OHOPS!

Unfortunately the listing for the **TYPEWRITER** program was omitted from the **BITING INTO THE 6510** article in our November 1987 issue. This program is presented in this month's Listings section.

Please note that the assembly listings presented in this series are all based on our own **SPEEDY ASSEMBLER**. This program is available, complete with manual, from our Readers Services department - see the Software for Sale pages for more details.

Bag Finder

We'd like to remind our readers that we run a **Bag Finder** service.

If you have typed in one of our programs and despite much checking, you still can't get it to run, then send us the following:

Two copies of your program on a tape or disk.

A description of your problem. If possible a listing of your work (you may omit this).

A stamped, self-addressed envelope for return of the program to you.

Should any of the above be missing then we will not be able to deal with your query.

We will try to point out where you have made errors and place a corrected copy of the program back on to your tape or disk before we return it to you.

Do not send a program to us as soon as it stops working, please check it several times first.

We do get a large number of queries and so it may take a while for us to deal with yours personally.

Notews can only deal with problems relating to programs published in *Four Commodore*.

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

Puzzle Corner

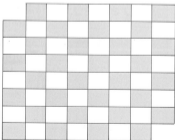
Take a close look at the diagram accompanying this test. The diagram is of a standard chess board with the two diagonally opposite corners missing.

Now, imagine that you have 31 dominos, each of which covers exactly two squares.

Is it possible to cover the entire board using the dominos? If it is, enclose a sketch showing how you did it. If not give a brief explanation of why not.

The first correct answer pulled out of the hat after the closing date of Thursday, 31st December 1987 will win a Four Commodore binder.

Entries should be sent to: Four Commodore, Puzzle Corner, 1 Golden Square, London W1R 1AJ.



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While many people continue to call it a fax, the TNC is the most important of the TNC's programs with several new features. The Host mode of the new PU-27 Packet Controller can be altered to improve terminal program operation. New commands in the PU-27 allow you to monitor the use of your station for both contacts and use capabilities. The feature monitoring command allows monitoring without having the carriage leaders. While the PU-27 can be used for RT operation, AEA recommends the optional PU-7 packet modem for low speed work. In addition to standard Data Carrier Detect, Flush to end, Status and Control indicators, the PU-27 features a serial LED for operational mode (Command, Transmission, Command) and multiple contacts.



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