



# C16 C16 PLUS/4

## COMMODORE COMPUTING MONTHLY

THE ONLY COMMODORE C16 C16 & PLUS/4 NEWSLETTER THAT IS MONTHLY!

### Software:

hands  
Reviews

### Hardware:

FOR SALES  
&  
WANTS

### Hoky Poky!

DDOS  
&  
SOOS!

### CONTENTS

Page No.	Contents
1	This Page
2	Ed's Notes
3 & 4	Reviews By Martin Sullivan
5	Review By Mark Lennon & Ad
6	Review By Andy Tang
7 & 8	For Sale/Wanted page
9	Members Letter
10	Review By Matt-N-Lewis
11, 12, 13 & 14	Blooming Bug Part 6
15, 16, 17, 18 & 20	Blooming Bug Part 7
19 & 20	Device Numbers
21 & 22	Changing Device Numbers
23, 24, 25, 26, 27 & 28	Last Part of The U-Ground Prog
29 & 30	Some Old Ad's
31, 32, 33, 34, 35 & 36	Kingsway PD S/W list & form

VOLUME 2 ISSUE 3 & 4 JUNE/JULY  
1990

## Ed's Notes

Hello folks, welcome to the June/July Bumper Issue. Sorry its a bit late! Anyway the days are long, the weather is hot, what more could you ask for, lots more, but I won't list them.

Right down to business, the COMPETITION, I'm stopping it because I've only had one entrant, that was Keven Wheals, and I'll have a word with him to send him a few FREE issues for his effort many thanks, Kevin, as for the rest of you whats happened, have you all got bored with your C16/+4's, eh, come on send some stuff in because I shall have to think seriously about the future of the mag, because at the moment, I can't see a very bright future, YET!!!!!!

Also, Philip Saunders has only had one Idea for a future C16 game, come on, he went to the effort to find a programmer that would be willing to turn your ideas into a game, get writing to him, by the way I was the only one that sent the idea for a future game, Philips address is:- Philip Saunders, 90 Oakbank, Fieldway, New Addington, CROYDON, SURREY, CRO 9EF. Also Philip pointed out some errors that appeared in Basic Course Part 1 in the April 1990 ish, also he has taken over the basic course so look out for his articles in the near future. He are the errors corrected:-

- 1) In the 3rd Program the \$ was missing from the CHR command, so ot should be CHR\$ etc.
- 2) The ASCII code for 78 produces an 'N'. You should have given the ASCII Code of 79 which would produce 'O' to complete the program to spell 'HELLO'.

Just a quick thanks to Matt Lewis thanks for Spore and other S/W, I thinking of something to give them away, thanks again.

Mark Lennon has suggested that the mag produces a Computer Game Hit Chart, something like the Top 10 for the month, so send in your top 5 Games and lets see what comes of that!!

I said last ish that I would reveal more about QUIXAVER, but I've decided that you will have to buy the prog to use and read about it, The price is yet to be arranged, but full instructions will come with the prog.

Full PD and Book hire details available in August issue, AT LAST I here you say!!

One last note, you will find enclosed with this mag a colour printed picture of a the MicroScope prog, many thanks to Rob Marshall for the pictures, Rob continues his articles in the August issue, along with more stuff for your C16/+4.

I'll sign of now, byeee!!!!!!

Roy Robinson, 112 Cliff Road, HORNSEA, N. Humberside, HU18 1JE.  
Tel 0964-534611 after 7pm weekdays Mon-Thur, not Fri, Sat & Sun you may catch me.



See you 190

## GAME REVIEWS

Game: Triple Decker 7 (Trailblazer/ Jetbrix/Laza)

Price £1.99

Reviewer: Martin Sullivan, SUFFOLK.

### TRAILBLAZER

This game has 16 course of squares which you have to pass through in a certain time. The time depends on how quickly you completed the last level (you control the football).

There are several colours of squares, each with a different purpose, they are: -

Red Squares - Slow you down  
Blue Squares - Make you jump  
Green Squares - Pseed you up  
Purple Squares - Throw you backwards  
Cyan Squares - Reverses Right/Left Controls

This is a fast & fun game where you have to be quick on the controls or you'll fall though the holes! The screen shot is that bad, it has a 3D effect so you can see which square you are going to hit next.

Great value for money!

GRAPHICS: 70  
PLAYABILITY: 80  
SOUND: 40  
VFM: 99  
OVERALL: 75

RATINGS OUT OF 100.

### JETBRIX

Another good game! In this game you have to blast a hole into the bottom of a brick wall. In order to do this you must catch the spinners & bombs whilst destroying the falling bricks. It has quite good graphics & very easy to play, ( the music is'nt to bad either, ED).

GRAPHICS: 90  
PLAYABILITY: 90  
SOUND: 90  
VFM: 99  
OVERALL: 90

RATINGS OUT OF 100

## TRIPLE DECKER REVIEWS CON'T

### LAZA

In this game you have to hit different coloured squares as they move around the screen. It does'nt have very good graphics but it does have quite good sound effects.

When you move you stay on the spot, you just move around (what Martin means is that the screen scrolls around you, I think, ED).

GRAPHICS: 20  
PLAYABILITY: 10  
SOUND: 80  
VFM: 99  
OVERALL: 30

RATINGS OUT OF 100

## GAME REVIEW

TITLE: ON-CUE  
PUBLISHER: MAD (MASTERTRONIC ADDED DIMENSION)  
PRICE: £2.99  
REVIEWER: MARTIN SULLIVAN, SUFFOLK

This game is a must for people who are interested in Snooker or Pool, it is very good real life simulation of both, with excellent sound, the graphics are'nt that bad either!

Both of the games are on both sides with pool first on one side, then snooker, and on the other side snooker first, then pool.

It is very easy to play and get the hang of the controls (joystick only). You can choose your own level of ability when play against the computer (1-3) or you can have a two player game. There is only one thing wrong with it, that is, that when one ball goes over another, the other ball changes to the colour of the ball that went over it, eg, if the cue-ball went over a red, that red would change colour, to white, so that on you next shot you have to guess which ball is the cue-ball, which gets very irritating after a while.

Another good thing about it is that it loads very quickly, and with no problems, as most mastertronic games do. All in all a good game....

GRAPHICS: 7  
PLAYABILITY: 10  
SOUND: 10  
VFM: 8  
OVERALL: 10

THE RATINGS ARE OUT OF 10.

# GAME REVIEW

GAME REVIEWED: MR PUNIVERSE  
REVIEWER: MARK LENNON, WEST SUSSEX

'MR. PUNIVERSE' is another classic game from Mastertronic which was released back in 1986. The storyline goes that when dinosaurs ruled the earth a new breed on man was born. This new breed of mans destiny was to have sand kicked in thier faces! And who was the leader of these men? Yes you've guessed it 'MR. PUNIVERSE!'

In this game you have to take the role of Mr.Puniverse and guide him round 25 problem filled locations (I call them screens, ED), in his search for the vitamins that will keep him alive.

And believe you me, you will be doing that into the small hours because Mr.Puniverse is just brilliant! The graphics are great with a 3D effect used very well. There's so many different obstacles to get by you will never be bored, and some of the creatures are well weird. Constantly spitting bullets at you, and then theres steps which roll backwards to stop you moving. As for the sound, BRILLIANT!! One of the best, jolly tunes I have ever heard! (thats what you think, wait till the PD S/Ware is made available to you, some of the Musix will blow your ears!!).

Take my word for it Mr.Puniverse is awesome and you have got to get a copy!

Marks out of 100%

Graphics 80%  
SOUND 90%  
PLAYABILTIITY 92%  
VFM 100%  
OVERALL 90%

Company = Mastertronic  
Price = £1.99

ENGAGEMENTS  
REC'D/DAYS

# C.R.VIDEO

CHRISTIANINGE  
65K PACKAYS

TELEPHONE: 641046

55B OCCUPATION LANE, SHEFFIELD, S12 4PS

11, BRIGHTON

## VIDEO TITLE MASTER I

Commodore Plus/4 owners!

This easy to use programme. Six lines with thirteen rows of large self centering text. 107 colours possible for border, screen, background and mixed character colours. Plus normal size text on line six for scrolling R-L or usual mode in mixed colours. Full instructions included.

cassette ~~ONLY~~ £9.99 inc. p&p

## VIDEO TITLE MASTER II COMMODORE PLUS/4 & C64/128

A useful alternative to scrolling titles. Menu driven program allows you to design screens using five self centering text sizes (one size per line) Automatic or manual line selection. Change colour of any line or whole screen Easy to use. full instructions included Fastloading cassette ~~£15.00~~ inc. P&P (State micro).

*£13.00 per book to Club members only*

Mr. W. D. Brighton  
55<sup>a</sup> Occupation Lane  
SHEFFIELD S12 4PS  
0742 641046

from:

VIS

VIDEO

VIDEO  
EBOOK

## GAME REVIEW

TITLE: ARTHUR NOID  
PUBLISHER: ALTERNATIVE  
PRICE: £1.99

Arthur Noid is a superb version of the old arcade game 'breakout'. You control a bat with the task of destroying 32 different walls/patterns of bricks (ie, the 32 main levels of the game) by hitting a ball against the brick - clear the screen and you progress to the next level; and so on...

Occasionally bonus barrels will appear rolling down the screen towards you, they take effect if you catch them: Blue Barrels expand the size of the bat, Cyan makes the ball stick to the bat - just the thing to improve your aiming, Green provides you an extra life, red gives you the latest in 'bolt-on' lazer technology and finally Purple barrels divide the ball into three you bat can only handle on effect at a time, so once you have collected the barrel you want, its adviseable to avoid the rest or they'll take effect cancelling the previous one. Also theres alien Floboids who fly around the screen trying to collide with the ball deflecting it back at unpredictable and sometimes unfavourable angles.

The graphics are very colourful - proudly demonstrating the machines colour capabilities, all characters are nicely drawn especially the Floboids, theres also a good in-game tune that combines well with the game.

The game has depth - 32 main levels (which I mentioned before) and also bonus screens where you can dramatically increase your score with fear of losing a life. Its addictive, playable and theres plenty of variation between the levels.

Theres quite a few 'break-out' clones available for the C16/+4 (demolition, Reflex etc), but Arthur Noid is head and shoulders above the rest (wait until you see the 64K version of 'breakout' called Digital Ball, programmed in Hungary with Digitized Speaking and sound effects, and the game play is even better, ED).

Although this type of game is a bit out-dated; I'm sure C16/+4 owners will welcome Arthur Noid with open arms.

### RATINGS:

GRAPHICS:	8
SOUND:	8
PLAYABILITY:	8
VALUE:	20
OVERALL:	8

Reviewer: Andy Tang, LONDON.

FOR SALE & WANTED PAGE  
FOR SALE: -

C16/Plus/4 Printer Service:

Have you got Programs, Letters etc you want printing, but cannot afford a printer?

Well worry no more because C16/Plus/4 Printer Service is here! We can print out Basic Files from tape only, Basic programs saved with Turbo-Plus. Wordprocessor programs from 3+1. We can also print high/low res Graphic dumps from your programs (NOT PROTECTED COMMERCIAL ONES).

This service is exclusive to members of this Club and it costs only 60p for the first copy and 15p for any other copies there after. This price INCLUDES return postage and packing.

Please send your tape in a jiffy bag along with money and amount required to: -

Plus/4 Printer Service, Daniel Stokes, 35 Burleigh Way, CUFFLEY, Herts, EN6 4LG.

SERVICE: -

I have several programs (TYPE IN'S)  
GAMES, UTILITIES, etc  
for the C16/C116/+4, for tape and disc users  
all programs are FREE!!!!

Send S.A.E. for full details and list, to:-

Kevin Wheals, 12 Hilldown Road, Gadebridge, Hemel Hempstead, HERTS, HP1 3JE

FOR SALE: -

1541 DISK DRIVE + DISKS OF GAMES + UTILITIES	£100
PLUS/4 COMPUTER, PSU, J/STICK, D/SETTE & GAMES	£35
C64 COMPUTER, PSU, J/STICK, D/SETTE	£80

CONTACT:-

Dave, Brighton, 55B Occupation Lane, SHEFFIELD, S12 4PS.

FOR SALE: -

Commodore 16/+4 Pokes. For latest list write to:-

Mr Philip Saunders, C16 Pokes, 90 Oakbank, Fieldway, New Addington, Croydon, SURREY, CR0 9EF.

Free game to orders over £2.00 while stocks last.

WANTED: -

The C16 - PLUS/4 version of 'Nigel Mansell's Grand Prix'.

Please write to:-

Ronald de Bruin, Hyacinthstraat 8, NL 3261 XD Oud-Beyerland, HOLLAND.

For Sale: -

Selection of C16/+4 software, mostly games, please send an S. A. E for a list and details of prices to:-

Roy Robinson, 112 Cliff Road, HORNSEA, N. Humberside, HU18 1JE.

Tel (0964) 534611

FOR SALE

HARDWARE

1 X COMMODORE PLUS/4 + POWER SUPPLY & MANUAL  
1 X 1551 DISK DRIVE & POWER LEAD  
1 X 1531 DATASETTE  
1 X COMMODORE JOYSTICK (DAMAGED) + OTHERS  
1 X SCART TELEVISION LEAD CONNECTOR (AS NEW)  
1 X SPRINT 128 PRINTER INTERFACE (AS NEW)  
1 X 6 WAY, 2 PINS + EARTH, ADAPTER (FUSED)  
AND SPARES FOR BOTH PLUS/4 + 1551 DISK DRIVE

SOFTWARE

RIG ATTACK (TAPE)  
FORMULA ONE SIMULATOR (TAPE)  
PETALS OF DOOM (TAPE)  
SPACE SWEEP & INVADERS (TAPE)  
ATOMIC MISSION (CARTRIDGE)  
PIRATE ADVENTURE (CARTRIDGE)  
SPACE ODESSY (CARTRIDGE)  
JACK ATTACK (CARTRIDGE)  
GWYNN (TAPE)  
OLYMPIAD (TAPE)  
AN INTRODUCTION TO BASIC PART 1 (DISK & TAPE, WITH MANUAL)

BOOKS & MAGAZINES

C16/PLUS/4 REFERENCE BOOK  
J+C BUSINESS SYSTEMS PROGRAMMING MANUAL  
YOUR COMMODORE MAGS  
MARCH 1987  
JUNE, JULY, AUGUST, SEPT, OCT, NOV, DEC 1987  
JANUARY 1988  
MARCH, APRIL 1988  
JULY 1988  
SEPTEMBER, OCTOBER, NOVEMBER 1989

+ LOADS MORE SOFTWARE PROGS THAT I TYPED IN MYSELF.

MODEMS

SOME MODEMS ARE AVAILABLE, BUT YOU WILL HAVE TO CONTACT JOHN FOR SPECIFIC DETAILS ABOUT THESE.

FOR PRICES AND MORE DETAILS PLEASE WRITE TO:-

John Ronan  
Edermine House  
Rathronan  
Clonmel  
Co. Tipperary  
IRELAND

or Telephone:-

010 353 52 23048, this is the number if you call from ENGLAND.



## MEMBERS LETTER

Dear Roy

First of all I must tell you how impressed with the mag I am! I am now appealing to the members for help...

Does anyone know:

- 1) If a machine-code compiler has ever been made for the plus/4?
- 2) If it is possible to get a 'RAM-PACK' for the plus/4? Or any other tips for expanding the memory?
- 3) Can you recommend any WYSIWYG (What You See Is What You Get) word processors or any DTP packages for the Plus/4?

At present, my computer is being repaired (I didn't know you could do it for me!). If Peter Appleby thinks he is being ripped off, I think I am going to have to pay well over £50.00 to repair mine! I don't know why, but when I switched on, all I get is a blank, black screen. Nothing happens when I press the reset button etc.

However perhaps you can save me some money, my heads on my MPS 801 printer need replacing, can you let me know if you can help?

Thanks again for an excellent mag  
Yours Computingly  
Matt Thornfield.

P.S Why have you used C116 in the name, and not C264 as well (C264 was the original plus/4?), (don't know really, ED)

*First of all I must welcome Matt Thornfield into the Club as a new member, right now down to the nitty gritty.*  
*In answer to Q1, I have'nt heard of or seen any COMPILERS for the +4, but I know that there are assemblers, help please members!!*  
*Q2, I have'nt seen any RAM-PACKS for the +4, but you will have seen on the May Cover the 256K Plus 4 bit, well at the moment I'm trying to draw up plans to make the Plus 4 into a 256K machine, by paging in the extra memory, just like you do when accessing the memory from \$8000 - \$FF00 on the +4, but you'll have to wait a bit for that.*  
*Q3, don't know of any WP's like that, but there are some DTP art Progs for the +4, I'm getting hold of them, so I'm afraid you have to wait for that as well. Your computer sounds like it needs a new CPU or TED chip, CPU = £10.00, TED = approx £25 - £30. As for the printer I can't help as I don't have a printer but if any members can help write to the address below, PLEASE!!! I hope I've been of some assistance, all the best, Roy Robinson, ED.*

Matthew Thornfield, 8 Greencroft Ave, Ruislip, MIDDX, HA4 9JJ or phone: 081-868-0811.

## Game Review

=====

Game Reviewed: Dingbat  
Publisher : Mastertronic  
Price : £1.99  
Reviewer : Matthew Newton-Lewis, West Sussex

Dingbat is another in the big collection of Mastertronic games. Each level is played on one screen with you and various other meanies. You fly about the screen with help of your jet-pack on your back. The jet-pack and phaser are both activated by the fire button, so of course you can only fire your phaser with the jet-pack being activated as well. However the game is made a lot harder because of gravity, the moving tanks firing missiles from the bottom of the screen and some weird and wonderful flying craft in the playing area.

Upon firing you naturally lose some fuel which slowly decreases on the score board. The idea of how to complete each level is relatively easy, all you have to do is shoot everything in sight and collect the triangle or fuel bonus which they leave behind falling from the sky.

After you have collected enough triangles you will be magically transported to the next level, and thus a game is created! However, as they say, the game's harder than it looks, you need skill, dexterity and quick thinking to complete the challenge.

This game was written by Shaun Southern (alias SOUT) and has the same kind of touch which all his games seem to have, i.e the colour pulsating score board, various familiar sounds, etc.

The graphics are nothing special but they suit the game and therefore are effective. The detail in the graphics is as good as it could be. The scrolling for all the sprites is very good.

The sound is again nothing special although this doesn't matter as game doesn't need much sound. It's pretty samey with the good old bangs and crackles.

If anybody has got or has ever seen JETBRIX (by Gremlin) it's much the same. Again Jetbrix was written by Sout and has the same man and slightly worse controls and ideas. Jetbrix was made before Dingbat so I think it was either just to see how the idea of the worked or just a first attempt tester.

Overall I think this game is imaginative and well worth every penny. If you follow Sout's games and you have enjoyed the better ones this is the game for you. Like all the C16 games I think you have to appreciate how limited the memory can be and how much has been crammed in. Also when reading the ratings take in to consideration that I haven't been too generous. If you see the game on the shelf, buy it, you've got nothing to lose!

Ratings as a percentage:

GRAPHICS	: 82%
SOUND	: 71%
PLAYABILITY	: 88%
V.F.M.	: 85%
OVERALL	: 83%

\*\*\*\*\*  
 \*\*\*\*\* BLOPING BUG part six \*\*\*\*\*  
 \*\*\*\*\*

By PETER and MELANIE CRACK.

\* This month i would like to explain the sprite pointers and how they are  
 \* used, but first lead both parts of the programme from MONITOR.  
 \* Next type in M4800 position the cursor over the first data byte and type  
 \* it all in, but be carefull this data area is critical any mistakes and  
 \* the programme will crash, so please check it thoroughly.  
 \* And now for the explanation.  
 \* There are eight different sprites used in the game, these are as follows.  
 \* 1, 5 characters wide by 5 characters deep, first generation blooping bug.  
 \* 2, 4 " " " 4 " " second " " "  
 \* 3, 3 " " " 4 " " third " " "  
 \* 4, 2 " " " 3 " " fourth " " "  
 \* 5, 1 " " " 1 " " finall " " "  
 \* 6, 2 " " " 2 " " bug buster called 'you' in  
 \* instructions, with shot bug in centre.  
 \* 7, 2 " " " 2 " " same as above but without shot  
 \* bug.  
 \* 8, 1 " " " 1 " " shot bug sprite.  
 \* There is one other used at the end of the game this is 4 by 4 characters  
 \* in size.  
 \* 4800-48FF Consists of sixteen groups of sprite pointers,each group is for  
 \* one size of sprite and each group is for one data area, therefore group  
 \* one (4800-480F) is for one page of data area (8000-B0FF) and so on.  
 \* This is a breakdown of the first group all the others are the same.  
 \* 4800 transfers to \$D4, position of first byte of sprite in screen data  
 \* area, this is the low half.  
 \* 4801 transfers to \$D1, as above but the high half of the address.  
 \* The above two bytes point to the top left hand corner of the sprite.  
 \* 4802 transfers to \$D6, speed register determines how far sprite is moved  
 \* between prints.  
 \* 4803 transfers to \$D7, rotation index, when the sprite is moved left or  
 \* right it is moved two pxels at a time, this is because we eare in MCM mode  
 \* and the colours are decided by the state of each pair of bits, \$D7 keeps  
 \* track of how many times this has been done, when the sprite has moved four  
 \* times in the same direction, the sprite is reloaded in its original form  
 \* and at the same time moved one byte in the direction it is traveling  
 \* before it is printed back into the screen.  
 \* 4804 transferes to \$DB, collision detection, the routine at \$4500-\$45C0  
 \* checks, among other things if the moving sprite has colided with any thing  
 \* on the screen (as this particular sprite process does not allow for  
 \* background it can only be another sprite) and sets \$DB as follows.  
 \* Bit 0=1 means a hit at the bottom of the sprite.  
 \* " 1=1 " " top " "  
 \* " 2=1 " " right " "  
 \* " 3=1 " " left " "  
 \* when writing your own programme these can be used or ignored as you wish.  
 \* 4805 transferes to \$D9, this is the string length pointer, that is the  
 \* number of bytes plus one that make up the sprite.  
 \* 4806 transferes to \$DA, sprite depth pointer, this is the number of rows  
 \* down the screen the sprite extends, in this programme it is an exact  
 \* number of character squares but of course it need not be so.  
 \* 4807 transferes to \$DB, this is the sprite width pointer, always an exact  
 \* number of character squares (or whole bytes across the screen) plus one,  
 \* (a 4 by 4 sprite is four bytes or character squares wide, visible, plus a  
 \* fifth square on the right hand end which is empty,when moving across the  
 \* screen the sprite is rotated into this empty area, when it has completely  
 \* moved into this empty area the sprite is reloaded into its original  
 \* position and at the same time moved one character square in the direction  
 \* it is moving) this description was for moving right but the same is rules  
 \* apply for moving left except that the mpty area is on the left hand end of  
 \* the sprite, thus an impression of smooth movement is obtained.

\*\*\*\*\*  
 \*\*\*\*\* CONTINUED \*\*\*\*\*

```

*****
* 4808 transferes to $DC, delay reload pointer, this is decreased or
* or increased to alter speed, giving a sort of inertia to movement.
* 4809 transferes to $DD, delay count pointer, this is counted down to zero,
* at zero movement is carried out and it is then reloaded with $DC, this is
* the BUG BUSTER only.
* 480A, 480B transfer to $DE and $DF respectively, these two pointers are set
* to point to the center of the sprite the first downwards the second across
* these are used to A, prevent the sprite moving out of the play area, B to
* determine exactly where the sprite is and C, to establish if it has been
* hit, in this game only a near to centre hit causes the bugs to mutate
* into their next generation, the accuracy is of course, set by the
* programmer.
* 480C transferes to $E0, side movement pointer, this is set to $80 if the
* sprite is moving left and $40 if it is moving right, this pointer is used
* to enable sprite collision detection to be carried out.
* 480D transferes to $E1, this is the page number where the original sprite
* data is stored, sprite data area $E000 to $E400 (pages B0 to B4) contain
* all the 'BLOPING BUG' definitions, when the first bug is hit the pointer
* $E1 is increased by one and two of the new $E1 page sprites are created.
* 480E transferes to $430A, the value of this pointer tells the routine at
* $4308-$4320 in which direction this sprite is moving (left or right) .
* 480F transferes to $4318, same as above but up or down. Because each
* sprite can move in a diferent direction to any other a record has to be
* kept, and this is it, the movement routines are at $4400,$4450,$44A0,$44D8
* as you can see only the lower half of each address changes so only one
* byte pointers are maintained.
* This completes the first section, the next is a group of eight bytes from
* $4900 to 497F, one line for each sprite as follows.
* 4900 transferes to various routines in the programme, if only one sprite
* is used and background data is on the screen this is the page in which
* data is stored, but in this programme there will be many sprites so no
* background data is allowed, so this page contains the old sprite data that
* is to say the data of the sprite which is about to be erased from the
* screen before the new one is printed, this data is EORed with the
* corresponding screen byte and the result stored in the screen the result is
* that the old sprite is erased and only the those bits which were not
* covered by this old sprite are left on the screen this is one of the
* reasons why background data cannot be used.
* 4901 again placed in various routines, this is the sprite working area
* as this is one long string it can be ROLLED left or right to enable the
* sprite to be moved just two pixels at a time.
* 4902 placed in various routines, this is the string initial position data
* and is reloaded into the work area if a sprite has been ROLLED left or
* right so far as to make a move to a new character square necessary.
* 4903 transfered to $E2, this is the sprite movement limit pointer (moving
* right) to prevent movement off the right hand edge of the screen, it can
* of course be set to any value you like (especially if you have, say the
* inside of a cockpit or some other no-go area printed on the right hand
* edge).
* 4904 transferes to $E3, exactly as above but in the downwards direction
* it is very important that the sprite does not wander off the bottom edge
* of the screen, A, because in this programme we have the title and score
* displayed there and B, even more important the programme code is stored
* just below the screen from $4000 to $57BF and if not stopped any of the
* sprites will quite easily overwrite the lot.
* 4905 transferes to $E6, as above but in the left direction.
* 4906 transferes to $E7, as above but in the up direction, if this is
* incorrectly set the screen gets a bad case of measles and the sprite
* overwrites the colour memory.
* 4907 NOT USED.
* 4908 to 497F as 4900 to 4907 but for all the other sprites.
* 4980 to 4983 delay reloads for 'you' or 'bug buster' sprite movement.
* 4988 to 498B movement offsets for routine at $4A32 (Joystick return
* evaluation).
* 4990 to 4993 delay counters for 'you' or 'bug buster' sprite movement.
*****

```

THIS IS  
ADDED BY  
THE PROGRAM.

\*\*\*\*\*  
 \* 49E0 to 49EF sprite active list \$FF=this sprite not active.  
 \* The above data \$4800 to \$49FF is the set-up values they are all transfered  
 \* to \$4600-\$47FF programme working area at the beginning of the game and  
 \* again every time the programme is re-run.  
 \* C200-C2FF this is the area where the final sprite is stored, if you  
 \* examine it you will see that it is a 4 by 4 sprite, the first byte of the  
 \* string is always zero this is for pixel movement purposes, then follows 4  
 \* sprite bytes then another zero byte then 4 more sprite bytes followed by  
 \* another zero byte and so on until the last sprite row which is followed by  
 \* another zero byte. The first and last bytes are never printed on the .  
 \* screen but the byte following the four sprite bytes is, so with this  
 \* sprite, printed on screen are four columns of visible sprite plus one  
 \* column of empty bytes (on the right at first) as the sprite moves right  
 \* two pixels per turn it will cover four columns as before but with a column  
 \* two pixels wide empty on the left and in the fifth column two pixels  
 \* filled the next move will fill 4 pixels on the fifth column but leave 4  
 \* pixels empty on the left, two more moves will fill the fifth column but  
 \* leave the first column empty at this point the original sprite data is  
 \* reloaded into the sprite working area and if it is not moved one column or  
 \* byte or character square to the right it will appear to fly back to its  
 \* start position, so we move it to the right one byte and it gives an  
 \* impression of smooth movement, the same applies to left movement, the  
 \* cycle is now complete and we start all over again.  
 \* movement up or down is far simpler as the start of printing on screen  
 \* address has only to be increased or decreased by one as outlined in the  
 \* MARCH issue.  
 \* This months additions still do not allow this programme to run but if you  
 \* have saved it to tape or disc you could give it a go and see what happens.  
 \* To save this programme type S'name 1',8,4000,5000 and press return,  
 \* then type S'name 2',8,B000,C300 and press return change 8 to 1 for tape  
 \* saves. any problems or hints or any other queries write in to the  
 \* mag or give me a ring on 081-367-3152. all the best PETER.\*\*\*\*\*

THIS MAGAZINE NEEDS YOUR ARTICLES!!

PROGRAMS

REVIEWS



SO SEND THEM TO: -  
 ROY ROBINSON, 112 CLIFF ROAD, HORNSEA N. HUMBERSIDE, HU18 1JE.  
 TELEPHONE: 0964-534611 after 6pm but not on Friday Night.

O R E L S E ! ! !

IN FACT ANYTHING TO DO WITH THE C16/C116/+4 IS MOST WELCOME. .

```

>4800 00 20 00 00 00 E5 25 30 :. ...eX0
>4808 00 00 0A 13 40 00 00 D8 :....e..X
>4810 00 20 00 00 00 A1 1F 28 :. ....!(
>4818 00 00 07 0F 40 00 00 D8 :....e..X
>4820 00 20 00 00 00 61 17 20 :. ....a.
>4828 00 00 06 0C 40 00 00 D8 :....e..X
>4830 00 20 00 00 00 31 0F 18 :. ....1..
>4838 00 00 03 07 40 00 00 D8 :....e..X
>4840 00 20 00 00 00 11 07 10 :. ....1..
>4848 00 00 02 03 40 00 00 D8 :....e..X
>4850 00 20 00 00 00 31 0F 18 :. ....1..
>4858 00 00 04 07 40 00 00 D8 :....e..X
>4860 00 20 03 00 00 0D 05 10 :. ....1..
>4868 00 00 01 02 40 00 00 D8 :....e..X
>4870 00 20 00 00 00 31 0F 18 :. ....1..
>4878 00 00 04 07 40 00 00 D8 :....e..X
>4880 00 00 00 00 00 00 00 00 :.....
>4888 00 00 00 00 00 00 00 00 :.....
>4890 00 00 00 00 00 00 00 00 :.....
>4898 00 00 00 00 00 00 00 00 :.....
>48A0 00 00 00 00 00 00 00 00 :.....
>48A8 00 00 00 00 00 00 00 00 :.....
>48B0 00 00 00 00 00 00 00 00 :.....
>48B8 00 00 00 00 00 00 00 00 :.....
>48C0 00 00 00 00 00 00 00 00 :.....
>48C8 00 00 00 00 00 00 00 00 :.....
>48D0 00 00 00 00 00 00 00 00 :.....
>48D8 00 00 00 00 00 00 00 FF :.....
>48E0 00 20 00 00 00 31 0F 18 :. ....1..
>48E8 00 00 07 03 40 00 00 D8 :....e..X
>48F0 00 20 02 00 00 0D 05 10 :. ....1..
>48F8 00 00 02 01 40 00 00 D8 :....e..X
>4900 83 84 85 96 9D 09 13 00 :.....
>4908 86 87 88 97 9F 06 0F 00 :.....
>4910 89 8A 8B 9A A4 05 0C 00 :.....$
>4918 92 93 94 9B A7 02 07 00 :.....'
>4920 80 81 82 9E AB 01 03 00 :.....+
>4928 92 93 94 9C A7 04 07 00 :.....'
>4930 80 81 82 9D AB 00 03 00 :.....+
>4938 92 93 94 9C A7 04 07 00 :.....'
>4940 00 00 00 00 00 00 00 00 :.....
>4948 00 00 00 00 00 00 00 00 :.....
>4950 00 00 00 00 00 00 00 00 :.....
>4958 00 00 00 00 00 00 00 00 :.....
>4960 00 00 00 00 00 00 00 00 :.....
>4968 00 00 00 00 00 00 00 00 :.....
>4970 8C 8D 8E 9F BB 06 03 00 :.....;
>4978 8F 90 91 9E C3 00 01 00 :....C...
>4980 04 04 04 04 04 00 00 00 :.....
>4988 A0 00 D8 50 00 00 00 00 :. ...XP....
>4990 04 04 04 04 00 00 00 00 :.....
>4998 00 00 00 00 00 00 00 00 :.....
>49A0 00 00 00 00 00 00 00 00 :.....
>49A8 00 00 00 00 00 00 00 00 :.....
>49B0 00 00 00 00 00 00 00 00 :.....
>49B8 00 00 00 00 00 00 00 00 :.....
>49C0 00 00 00 00 00 00 00 00 :.....
>49CB 00 00 00 00 00 00 00 00 :.....
>49D0 82 85 88 8B 8E 91 94 97 :.....
>49DB 9A 9D A0 A3 A6 A9 AC AF :.. $&)/
>49E0 FF FF FF FF FF FF FF FF :
>49E8 FF FF FF FF FF FF FF FF :
>49F0 FF FF FF FF FF FF FF FF :
>49FB FF FF FF FF FF FF FF FF :

```

```

>C200 00 3F FF FC 00 0F FF F0 :.?!...p
>C208 00 00 00 00 00 00 00 00 :.....
>C210 00 FF 33 03 00 FF 33 03 :.3..3.
>C218 00 C0 33 C3 00 C0 33 C3 :.e3C.e3C
>C220 00 C0 33 33 00 C0 33 33 :.e33.e33
>C228 00 C0 33 33 00 F0 33 33 :.e33.p33
>C230 00 F0 33 33 00 C0 33 33 :.p33.e33
>C238 00 C0 33 33 00 C0 33 33 :.e33.e33
>C240 00 C0 33 0F 00 C0 33 0F :.e3..e3.
>C248 00 C0 33 03 00 C0 33 03 :.e3..e3.
>C250 00 00 00 00 00 00 00 00 :.....
>C258 00 0F FF F0 00 3F FF FC :..p.?!
>C260 00 00 00 00 00 00 00 00 :.....
>C268 00 00 00 00 00 00 00 00 :.....
>C270 00 00 00 00 00 00 00 00 :.....
>C278 00 00 00 00 00 00 00 00 :.....
>C280 00 00 00 00 00 00 00 00 :.....
>C288 00 00 00 00 00 00 00 00 :.....
>C290 00 00 00 00 00 00 00 00 :.....
>C298 00 00 00 00 00 00 00 00 :.....
>C2A0 00 00 00 00 00 00 00 00 :.....
>C2A8 00 00 00 00 00 00 00 00 :.....
>C2B0 00 00 00 00 00 00 00 00 :.....
>C2B8 00 00 00 00 00 00 00 00 :.....
>C2C0 00 00 00 00 00 00 00 00 :.....
>C2C8 00 00 00 00 00 00 00 00 :.....
>C2D0 00 00 00 00 00 00 00 00 :.....
>C2D8 00 00 00 00 00 00 00 00 :.....
>C2E0 00 00 00 00 00 00 00 00 :.....
>C2EB 00 00 00 00 00 00 00 00 :.....
>C2FB 00 00 00 00 00 00 00 00 :.....

```

CONT OVER →

```

*****
***** BLOPING BUG part eight *****
* By PETER and MELANIE CRACK.
* This month I will continue with the main programme and I hope at the end
* you will be able to see the first sprite move just a little way across the
* screen. As with last month first load both parts of the programme from
* MONITOR, then type in D4AF0 and press return, now enter the programme as
* listed.....Here is the explanation.
4AF0-4AF3 Load 'Y' register with number of times to move first sprite,
* transfer 'Y' to 'A' register and save a copy to stack.
4AF4 Gosub 'process sprite'.
4AF7-4AFC Pull move counter off stack transfer it to 'Y' register decrease
* it by one and check to see if it has been counted down to zero
* if not then branch to $4AF2 else return from gosub.
42B0-42FB This routine starts and ends all active sprite movement.
42B0-42BF disable interrupts, switch out ROM and switch in RAM, clear 'Y'
* register, transfer 'Y' to 'A' registers, and save a copy on stack.
42C0-42CB Begin search of sprite active list, load 'A' register with $47E0
* offset by 'Y' register, compare it with $FF if yes then branch to
* $42F2 else.....
42C9 Gosub 'get sprite pointers'.
42CC-42D0 Load 'A' register with $E5 compare it with $E6 (is it 'you'
* sprite), if not branch to $42E6 else.....
42D2-42D4 Load 'A' register with collision pointer, check to see if it is
* zero if yes (no collision) then branch to $42E3 else.....
42D6-42DE Reset 'you' sprite delay reloads to highest value.
42E0-42E3 Will be explained later.
42E6 Gosub 'evaluate hits and collisions'.
42E9 Gosub 'move routine'.
42EC Gosub 'print routine'.
42EF Gosub 'collect sprite data routine'.
42F2-42F7 Pull sprite list counter back off stack, transfer to 'Y' register,
* increase it by one and compare it to $10 (have all the sprites
* been processed?) if no branch to $42BE and do it all again else...
42F9-42FD Switch ROM back in, allow interrupts and jump to next part of prog.
4398-43DF Evaluate collision between active sprite and other sprites.
4398-439E Load 'A' register with active sprite number, compare it with $0F
* (is it 'shot' sprite?) if it is then branch to $4360 else.....
43A0-43A2 Load 'A' register with collision pointer, compare it with zero
* (has collision occured?) if zero then branch to $43D3 else.....
43A4-43C1 A series of four routines each one starting by shifting all the in
* the 'A' register (which now contains the collision pointer) one
* position to the right, the bit which drops out of the right hand
* end of the byte is placed into the carry flag, this is then tested
* in the next command to see if it set to zero (carry clear 'BCC')
* if yes then branch to next LSR, if not then collision has occured
* on that face of the sprite (top, bottom, left or right in that
* order) and place correct order in move routine.
43C4 Increase speed register, when one sprite hits another the moving
* sprite has its speed doubled.
43C6 Gosub 'get random up or down movement delay', this makes the
* moving sprite bounce off another sprite or the edge of the screen
* at a slightly different angle each time.
43C9-43D1 Check speed pointer and make sure it does not exceed one, first
* load 'A' register with speed pointer then compare it with $02 if
* it is less then branch to $43D3 else load 'A' register with zero
* and store it in speed pointer.
43D3-43D5 Load 'A' register with collision pointer, compare it with zero,
* if it is then branch to $43DF else.....
43D7-43DF switch on voice two, volume three, the frequency was set in $5080
* to $508E and return from gosub.
* NOW START ON A NEW LINE ENTER D4300 AND PRESS RETURN.
4300-4320 evaluate move routine.
4300-4300 Load 'A' register with speed pointer ($D6) and save a copy on stack
*****

```

\*\*\*\*\* CONTINUED \*\*\*\*\*

```

*****
4309 Gosub 'move left or right', address $430A can contain either $500
* or $550 to create an address of $4400 or $4450 to enable move to
* left or right, addresses $4318 and $430A are picked up by the end
* of active sprite routine at $41A0 to $41C5 to give a history of
* the direction the sprite last moved.
430C-4311 Load 'Y' register with $DD (delay counter), dectase 'Y' register
* one and check to see if it has been counted down to $FF (-1) if
* not then branch to $431A else.....
4313-4315 load 'A' register with $DC (delay reload) and store it in $DD
4317 Gosub 'move up or down'. Address $4318 can contain either $A0 or
* $B8 to create an address of $44A0 or $44D8 to enable the
* subroutine, because these values are placed by another routine
* it is very important that the addresses given in the listings
* are checked carefully against the addresses you enter.
431A-4320 Full speed counter off stack transfer it to 'Y' register, decrease
* it by one, transfer it to 'A' register, check to see if it has
* been counted down to $FF if no then branch to $4302 and move the
* sprite again else return from subroutine.
* NOW ON A NEW LINE ENTER D4400 AND PRESS RETURN THEN CARRY ON.
4400-444C This routine moves the sprite two pixel points to the right.
4400-4409 Load 'A' register with $DE (sprite position across the screen)
* and compare it with $E2 (sprite movement limmit to right), and if
* equal it has reached the right hand edge of the screen or any
* other limmit placed in $E2, so branch to $43E8 (this routine will
* be explained next month), if not increase $DE by one, by moving
* two pixel points across the screen per turn a single byte can hold
* the limmit value, remember the screen is 320 pixel points wide
* and by moving two at a time but only counting it as one move we
* halve the number required to keep a track of its position to 160
* this number of course is less than the maximum that one byte can
* hold when using hi-res two pointers have to be used.
440A-4411 Load 'Y' register with $D7 (rotation index, I.E. the number of
* times we have moved right without moving one character square)
* increase it by one, compare it to $04, the maximum number of
* times we can move (two pixel points at a time) before we have to
* move a character square, if it is equal to $04 then branch to
* $4330 else store the new value in $D7.
4413-4414 Load 'Y' register with $01 (this will allow us to carry out the
* following routine twice.
4415-4416 Clear the carry flag and push the status register onto the stack.
4417 Load 'X' register with $01, this is our loop counter.
4419-441A Pull status register back off stack and load first byte of sprite
* data string from this sprites data area ($441C and $4421 are
* changed to point to each new sprites data area). At this point a
* word about the sprite data, this is stored in one long string
* byte by byte, we are about to move all the bits in all the bytes
* one position to the right (we will do this twice hence the $01
* in the 'Y' register at $4413 to $4414), now emagine if you will
* that each byte is a separate tube with a hole at each end and each
* byte is separated from the next by a small gap, if we take the
* first byte (the one at the left hand end of this data string), and
* and push its bits right one position (ROR command), then the bit
* at the right hand end will fall out, and a part of the sprites
* shape will be lost, this is where the carry flag comes in, for
* what ever is pushed out of the byte is put into the carry flag,
* which is in itself part of the status register, so by saving this
* register intact we can, later, put this lost bit into the next
* byte, SIMPLE EH!!! (it only took me two years to sort out).
441D Rotate 'A' register one bit to the right,(ROR) that is to say put
* whatever is in the carry flag into the left hand end of this byte
* and whatever is pushed out of the right hand end into the carry
* flag.
441E-441F Push status register onto the stack and store the modified byte
* back into the sprite string.
*****

```

16



```

4422-4425 Increase 'X' register by one (loop counter) and compare it with
*          $D9 (length of this sprites data string), if they are not equal
*          then branch to $4419 and do it all again else.....
4427-4429 Pull status register back off stack to put stack pointer into
*          correct position (remember all stack actions must be even, one on
*          must be balanced by one off just like gosub and return statements)
*          decrease 'Y' register by one and check to see if it has been
*          counted down to $FF if not branch to $4415 and move the string
*          another pixel point to the right else.....
442B-442F Load 'A' register with $40 and store it $E0 (this tells the
*          programme that this sprite has just moved to the right) and return
4430-444C This routine moves the sprite one character square to the right
*          and is only used if the comparison at $440F is true.
4430-4433 Clear carry flag, load 'A' register with $D2 ($D2 and $D3 are the
*          low and high halves of the screen address where the top lefthand
*          corner of the sprite was last printed) add $08, this moves the
*          sprite to the same position in the next character square.
4435-4437 Check to see if this addition rolls $D2 over $FF, if so then the
*          carry flag will be changed, therefore we test this flag to see if
*          it is still clear, if yes then branch to $4439 else increase $D3.
4439-443D Store 'A' register back into $D2 and clear $D7 (rotation counter).
443F-444C This routine was printed in the JULY issue and is already in place
*          briefly it transfers this sprites original data to the working
*          data area.
4450-449B The same as the previous routine only it moves the sprite left.
449D-44D4 This routine moves the sprite up one row.
449D      Will be explained next month when it is printed.
44A0-44A9 Load 'A' register with $DF (vertical position register), compare
*          it with $E7 ('UP' movement limit), if they are equal branch to
*          $449D else decrease $DF by one.
44AA-44B2 Gosub transfer present screen address from $D2,$D3 to $D0,$D1
*          load 'A' register with $D0, set the carry flag, decrease $D1 by
*          one and save a copy on stack.
44B3-44BB Remove the four leftmost bits from 'A' register byte, compare it
*          with $0F, if equal branch to $44C3, else compare it with $07
*          again if equal branch to $44C3 (this is to see if by decreasing
*          $D0 we have moved to the top byte of the next character square to
*          the left of our present position, the result of missing out this
*          check will be that the sprite instead of moving up the screen
*          will hop up and down while moving left on the same line.
44BD-44C1 O.K. neither of the above comparisons were true, so, pull $D0 back
*          off the stack and store it into $D0, now force branch to $44D1.
44C3-44CF Only used when movement is required from the top of one screen
*          line to the bottom of the next one up.
44C3      Because the last routine branched after one PHA and before the
*          balancing PLA commands, we make another PLA here and discard the
*          result.
44C4-44CF Load 'A' register with $D0, set the carry flag, subtract $39, and
*          store the result back into $D0, load 'A' register with $D1,
*          subtract $01 (and also the carry flag, if this was reset by the
*          previous subtraction we will be subtracting $02) and store it
*          back into $D1.
44D1-44D4 Gosub transfer $D0,$D1 to $D2,$D3 and return from subroutine.
44D5      Will be explained next month.
44DB-44EB Same as last routine only moving down.
*          And that completes this months addition to the programme, to run
*          this programme as far as it goes AND AFTER SAVING BOTH PARTS!!!
*          enter on a new line A4348 RTS and press return, this last command
*          will corrupt part of the programme so before entering it make sure
*          you have saved and verified both parts.
*          As always any problems or tips just call me on 081-367-3152 or
*          write in to the magazine.....PETER....
*****

```

. 4400	A5 DE	LDA \$DE	. 4473	28	PLP
. 4402	C5 E2	CMP \$E2	. 4474	88	DEY
. 4404	EA	NOP	. 4475	10 EC	BPL \$4463
. 4405	F0 E1	BEQ \$43E8	. 4477	A9 80	LDA \$580
. 4407	E6 DE	INC \$DE	. 4479	85 E0	STA \$E0
. 4409	EA	NOP	. 447B	60	RTS
. 440A	A4 D7	LDY \$D7	. 447C	A9 03	LDA \$503
. 440C	C8	INY	. 447E	85 D7	STA \$D7
. 440D	C0 04	CPY \$504	. 4480	A5 D2	LDA \$D2
. 440F	F0 1F	BEQ \$4430	. 4482	38	SEC
. 4411	84 D7	STY \$D7	. 4483	E9 08	SRC \$508
. 4413	A0 01	LDY \$501	. 4485	B0 02	BCE \$4489
. 4415	18	CLC	. 4487	C6 D3	DEC \$D3
. 4416	08	PHP	. 4489	85 D2	STA \$D2
. 4417	A2 01	LDX \$501	. 448B	A0 00	LDY \$500
. 4419	28	FLP	. 448D	B9 00 82	LDA \$8200,Y
. 441A	BD FF 80	LDA \$80FF,X	. 4490	99 00 81	STA \$8100,Y
. 441D	6A	ROR	. 4493	C8	INY
. 441E	08	PHP	. 4494	C4 D9	CPY \$D9
. 441F	9D FF 80	STA \$80FF,X	. 4496	D0 F5	BNE \$448D
. 4422	EB	INX	. 4498	60	RTS
. 4423	E4 D9	CPX \$D9	. 4499	EA	NOP
. 4425	D0 F2	BNE \$4419	. 449A	EA	NOP
. 4427	28	FLP	. 449B	EA	NOP
. 4428	88	DEY	. 449C	EA	NOP
. 4429	10 EA	BPL \$4415	. 449D	4C F0 43	JMP \$43F0
. 442B	A9 40	LDA \$540	. 44A0	A5 DF	LDA \$DF
. 442D	85 E0	STA \$E0	. 44A2	EA	NOP
. 442F	60	RTS	. 44A3	C5 E7	CMP \$E7
. 4430	18	CLC	. 44A5	F0 F6	BEQ \$449D
. 4431	A5 D2	LDA \$D2	. 44A7	C6 DF	DEC \$DF
. 4433	69 08	ADC \$508	. 44A9	EA	NOP
. 4435	90 02	BCC \$4439	. 44AA	20 E1 45	JSR \$45E1
. 4437	E6 D3	INC \$D3	. 44AD	A5 D0	LDA \$D0
. 4439	85 D2	STA \$D2	. 44AF	38	SEC
. 443B	A9 00	LDA \$500	. 44B0	E9 01	SBC \$501
. 443D	85 D7	STA \$D7	. 44B2	48	FHA
. 443F	A0 00	LDY \$500	. 44B3	29 0F	AND \$50F
. 4441	B9 01 82	LDA \$8201,Y	. 44B5	C9 0F	CMP \$50F
. 4444	99 00 81	STA \$8100,Y	. 44B7	F0 0A	BEQ \$44C3
. 4447	C8	INY	. 44B9	C9 07	CMP \$507
. 4448	C4 D9	CPY \$D9	. 44BB	F0 06	BEQ \$44C3
. 444A	D0 F5	BNE \$4441	. 44BD	68	FLA
. 444C	60	RTS	. 44BE	85 D0	STA \$D0
. 444D	EA	NOP	. 44C0	38	SEC
. 444E	EA	NOP	. 44C1	R0 0E	BCE \$44D1
. 444F	EA	NOP	. 44C3	68	PLA
. 4450	A5 DE	LDA \$DE	. 44C4	A5 D0	LDA \$D0
. 4452	EA	NOP	. 44C6	38	SEC
. 4453	C5 E6	CMP \$E6	. 44C7	E9 39	SBC \$539
. 4455	F0 89	BEQ \$43E0	. 44C9	85 D0	STA \$D0
. 4457	C6 DE	DEC \$DE	. 44CB	A5 D1	LDA \$D1
. 4459	EA	NOP	. 44CD	E9 01	SBC \$501
. 445A	A4 D7	LDY \$D7	. 44CF	85 D1	STA \$D1
. 445C	88	DEY	. 44D1	20 EC 45	JSR \$45EC
. 445D	30 1D	BMI \$447C	. 44D4	60	RTS
. 445F	84 D7	STY \$D7	. 44D5	4C F8 43	JMP \$43F8
. 4461	A0 01	LDY \$501	. 44D8	A5 DF	LDA \$DF
. 4463	18	CLC	. 44DA	EA	NOP
. 4464	08	PHP	. 44DB	C5 E3	CMP \$E3
. 4465	A6 D9	LDX \$D9	. 44DD	F0 F6	BEQ \$44D5
. 4467	28	FLP	. 44DF	E6 DF	INC \$DF
. 4468	BD FF 80	LDA \$80FF,X	. 44E1	EA	NOP
. 446B	2A	ROL	. 44E2	20 E1 45	JSR \$45E1
. 446C	08	PHP	. 44E5	20 C0 45	JSR \$45C0
. 446D	9D FF 80	STA \$80FF,X	. 44E8	20 EC 45	JSR \$45EC
. 4470	CA	DEX	. 44EB	60	RTS
. 4471	D0 F4	BNE \$4667	. 44EC	FA	NOP

CONT OH  
 PAGE 20

## DEVICE NUMBERS BY DAVID CAMPBELL

There are 256 possible device numbers (0-255) for use with the C13, C116 and the 44. Of these device numbers Commodore allocated the first 12 to specific devices, as shown in the following table.

<u>NUMBER</u>	<u>DEVICE</u>	<u>DIRECTION</u>
0	Keyboard	input
1	datasette	input/output (default device)
2	RS232C interface	input/output
3	video screen	input/output
4	Printer	output
5	2nd Printer	output
6	Plotter	output
7	2nd Plotter	output
8	disk drive	input/output
9	2nd disk drive	input/output
10	3rd disk drive	input/output
11	4th disk drive	input/output

I think that this gives enough flexibility to the user, but for several instances the other device numbers available are:

- 12-127 are for serial bus devices and
- 128-255 are for serial bus devices and used a linefeed (LF) after carriage return

## FOR SALE/WANTED

### FREE

Star NL10 Black Nylon Printer Ribbon, if you pay postage, the ribbon is approx 1ft long.

Contact Rob Marshall on 0622-871066 to see if he still has it

Rob Marshall, 89 Old Road, East Peckham, Tonbridge, KENT, TN12 5EN.

### WANTED

Help I'm doing a map for Joe Blade 2, has anybody already done one, or can you help me please, contact: Martin Sullivan on 0284-702737

Martin Sullivan, 8 Abbotsbury Road, Bury St. Edmunds, Suffolk, IP33 2HG.

### TIP FOR YOU!!!

Advance through levels in SQUIRM by pressing the 'U' key, By Andy Tang, LONDON.

The first choice for the C16, C116 and PLUS 4 has to be the 1551 because of its increased speed. All the Commodore Drives assure compatibility with the C16/C116/+4 computers (and C64 and C128s). The other three drives claim faster data transfer than the 1541 but this does not appear to be the case.

Bloop in a Bus PART 5 CONT.

. 42B8 78 SEI	. 4300 A5 D6 LDA \$D6
. 42B9 8D 3F FF STA \$FF3F	. 4302 48 PHA
. 42BC A0 00 LDY \$00	. 4303 EA NOP
. 42BE 98 TYA	. 4304 EA NOP
. 42BF 48 PHA	. 4305 EA NOP
. 42C0 B9 E0 47 LDA \$47E0,Y	. 4306 EA NOP
. 42C3 C9 FF CMP \$FF	. 4307 EA NOP
. 42C5 F0 2B BEQ \$42F2	. 4308 EA NOP
. 42C7 B5 E5 STA \$E5	. 4309 20 50 44 JSR \$4450
. 42C9 20 F0 41 JSR \$41F0	. 430C A4 DD LDY \$DD
. 42CC A5 E5 LDA \$E5	. 430E 88 DEY
. 42CE C9 0E CMP \$0E	. 430F 84 DD STY \$DD
. 42D0 D0 14 BNE \$42E6	. 4311 10 07 BPL \$431A
. 42D2 A5 D8 LDA \$D8	. 4313 A5 DC LDA \$DC
. 42D4 F0 0D BEQ \$42E3	. 4315 85 DD STA \$DD
. 42D6 A0 03 LDY \$03	. 4317 20 D8 44 JSR \$44D8
. 42D8 A9 04 LDA \$04	. 431A 68 PLA
. 42DA 99 80 47 STA \$4780,Y	. 431R A8 TAY
. 42DD 88 DEY	. 431C 88 DEY
. 42DE 10 FA BPL \$42DA	. 431D 98 TYA
. 42E0 20 06 41 JSR \$4106	. 431E 10 E2 BPL \$4302
. 42E3 4C 30 4A JMP \$4A30	. 4320 60 RTS
. 42E6 20 98 43 JSR \$4398	. 4321 EA NOP
. 42E9 20 00 43 JSR \$4300	
. 42EC 20 00 45 JSR \$4500	
. 42EF 20 A0 41 JSR \$41A0	. 4AF0 A0 18 LDY \$18
. 42F2 68 PLA	. 4AF2 98 TYA
. 42F3 A8 TAY	. 4AF3 48 PHA
. 42F4 C8 INY	. 4AF4 20 B8 42 JSR \$42B8
. 42F5 C0 10 CPY \$10	. 4AF7 68 PLA
. 42F7 D0 C5 BNE \$42BE	. 4AF8 A8 TAY
. 42F9 8D 3E FF STA \$FF3E	. 4AF9 88 DEY
. 42FC 58 CLI	. 4AFA D0 F6 BNE \$4AF6
. 42FD 4C 48 4E JMP \$4E48	. 4AFC 60 RTS
	. 4AFD EA NOP

20  
CONT NEXT ISAL

# CHANGING DISK DRIVE DEVICE NUMBERS

BY DAVID CAMPBELL

The C16 and Plus4 computers are capable of running a multiple disk system by chaining up to 4 disk drives together. However, Commodore manufacture all their disk drives with the device number 8 which creates a conflict in a multiple drive system. If all the units had the device number 8 they would be unsure which unit was being addressed so, to cover up their embarrassment, none of the drives would do anything at all they would just sit there and look at you. Luckily we can change the device number of a disk drive from 8 to 9,10 or 11.

There are two methods of changing device numbers, by the software method or the hardware method.

## 1) THE SOFTWARE METHOD

- i) Turn on the disk drive that you want to change and make sure that the others are switched off.

ii) Run in this short program -

```
10 OPEN 15,3,15
20 PRINT#15,"N-N"CHR$(110)CHR$(10)CHR$(10)CHR$(10)
   CHR$(32)+IN+CHR$(105)+IN
30 CLOSE15
```

Where 01 is the new device number that you the drive to be set to i.e. 9,10 or 11.

iii) Then RUN the program.

- iv) Now turn on the next unit, which will be device 9.

v) The procedure can be repeated if you wish to change the device number of several units, specifying a new number for each.

## 2) THE HARDWARE METHOD

This method involves making a slight adjustment to the circuit board of the disk drive. If performed carefully, this simple procedure will not invalidate the manufacturer's warranty.

Follow these steps -

- i) Disconnect all leads from the disk unit, especially the power lead.

ii) Turn the device cover downwards, the four screws holding the casing together.

iii) Turn the drive upright, you will remove the case top. The circuit board will be clearly visible.

- iv) You should now locate the two jumpers that control the device numbering of the unit.
- v) The positioning of these jumpers varies with the various disk drives. For example, in early versions of the 1541 the jumpers are to be found along the left edge (looking from the front) about half way down the length of the board. In this case jumper 1 is the one to the rear of the machine, with jumper 2 in front of it. Newer versions of the 1541 have the jumpers relocated to the centre-front of the board. In this case, jumper 1 is still the rearmost of the two connections.

Whatever disk drive your unit is, you should cut the jumpers according to the table in order to change the device number to your own requirements.

<u>NUMBER</u>	<u>JUMPER 1</u>	<u>JUMPER 2</u>
8	Joined	Joined
9	Cut	Joined
10	Joined	Cut
11	Cut	Cut

- vi) When you have carefully made the necessary breaks you should replace the top casing, the four screws and finally the cables. Your disk drive will then be ready for multiple unit use.

N.B. I do not recommend the use of the hardware method if you are unsure of what you are doing as you could invalidate your warranty. If you use the hardware method you do so at your own R I S K!

N.B. A jumper looks like a circle divided into two halves by a short horizontal bar. A jumper is about half the size of a finger nail.

UNDERGROUND PROG PART 6

```

3910 FORV=26410270:PRINTSPC(2);S*(V):NEX
T
3920 PRINTAB(5);"CHOOSE A KEY BETWEEN (
8-6)"
3930 GETM$:IFM$=""THEN3930
3940 IFM$="0"THENM$=3*(264):PRINTCL$;M$
GOTO4030
3950 IFM$="1"THENM$=3*(265):PRINTCL$;M$
GOTO4100
3960 IFM$="2"THENM$=3*(266):PRINTCL$;M$
GOTO4100
3970 IFM$="3"THENM$=3*(267):PRINTCL$;M$
GOTO4070
3980 IFM$="4"THENM$=3*(268):PRINTCL$;M$
GOTO4050
3990 IFM$="5"THENM$=3*(269):PRINTCL$;M$
GOTO4110
4000 IFM$="6"THENM$=3*(270):PRINTCL$;M$
GOTO4100
4010 GOTO290
4020 PRINTU$
4030 FORX=0T021:PRINTSX*(X):NEXT
4040 PRINTRR$;RETURN
4050 B=1:GOTO4630

```

```

4060 C=1:GOTO4630
4070 D=1:GOTO4630
4080 J=1:GOTO4630
4090 M=1:GOTO4630
4100 N=1:GOTO4630
4110 P=1:GOTO4630
4120 V=1:GOTO4630
4130 E=1:GOTO4630
4140 L=1:BR=1:GOTO4630
4150 EX=1:GOTO4630
4160 B=1:CH=1:L=1:GOTO4630
4170 C=1:CH=1:L=1:GOTO4630
4180 D=1:CH=1:L=1:GOTO4630
4190 J=1:CH=1:L=1:GOTO4630
4200 M=1:CH=1:L=1:GOTO4630
4210 N=1:CH=1:L=1:GOTO4630
4220 V=1:CH=1:L=1:GOTO4630

```

4238 B=1:F=1:G0T04638

4248 B=1:C=1:V=1:G0T04638

4258 B=1:CR=1:N=1:G0T04638

4268 B=1:N=1:CH=1:L=1:G0T04638

4278 B=1:CR=1:D=1:N=1:G0T04638

4288 B=1:CR=1:J=1:M=1:G0T04638

4298 B=1:J=1:N=1:CH=1:L=1:G0T04638

4308 B=1:CR=1:D=1:M=1:CH=1:L=1:G0T04638

4318 C=1:J=1:G0T04638

4328 C=1:M=1:G0T04638

4338 C=1:N=1:G0T04638

4348 C=1:P=1:G0T04638

4358 C=1:CR=1:D=1:G0T04638

4368 C=1:D=1:CH=1:L=1:G0T04638

4378 C=1:D=1:M=1:G0T04638

4388 C=1:N=1:L=1:BR=1:G0T04638

4398 C=1:CR=1:M=1:CH=1:L=1:G0T04638

4408 CR=1:D=1:G0T04638

4418 CR=1:M=1:G0T04638

4428 CR=1:D=1:CH=1:L=1:G0T04638

4438 CR=1:D=1:M=1:G0T04638

4448 CR=1:D=1:P=1:G0T04638

4458 CR=1:D=1:V=1:CH=1:L=1:G0T04638

4468 CR=1:M=1:N=1:CH=1:L=1:G0T04638

4478 CR=1:M=1:N=1:P=1:V=1:CH=1:L=1:G0T04638

4488 D=1:M=1:G0T04638

4498 D=1:P=1:G0T04638

4508 D=1:M=1:CH=1:L=1:G0T04638

4518 D=1:M=1:P=1:G0T04638

4528 D=1:M=1:E=1:G0T04638

4538 D=1:P=1:EK=1:G0T04638

4548 J=1:M=1:G0T04638

4558 J=1:P=1:V=1:G0T04638

4568 M=1:F=1:G0T04638



```

4570 E=1:CH=1:L=1:GOTO4630
4580 N=1:P=1:GOTO4630
4590 N=1:V=1:GOTO4630
4600 N=1:V=1:CH=1:L=1:GOTO4630
4610 N=1:L=1:BR=1:GOTO4630
4620 P=1:V=1:CH=1:L=1:GOTO4630
4630 IFB=1THENPRINTB$
4640 IFO=1THENPRINTOC$
4650 IFCR=1THENPRINTOCR$
4660 IFD=1THENPRINTDD$
4670 IFEX=1THENPRINTEX$
4680 IFJ=1THENPRINTJJ$
4690 IFM=1THENPRINTMM$
4700 IFE=1THENPRINTES$
4710 IFN=1THENPRINTNN$
4720 IFF=1THENPRINTFF$

```

```

4730 IFV=1THENPRINTV$
4740 IFCH=1THENPRINTCH$
4750 IFL=1THENPRINTLO$
4760 IFFR=1THENPRINTFR$
4770 PRINTXX$
4780 GETV$:IFY$=""THEN4780
4790 GOTO290
4800 COLOR4,2:COLOR0,2:COLOR1,3,5
4810 GRAPHIC1,1
4820 CHAR1,0,0,"*****TUBE STATION INFORMATION*****"
4830 BOX1,65,99,256,112,1
4840 CIRCLE1,160,100,78
4850 CIRCLE1,160,100,60
4860 PAINT1,88,98
4870 =-INT1,88,113
4880 CHAR1,0,24,"*****PRESS ANY KEY TO CONTINUE*****"
4890 GETV$:IFY$=""THEN4890

```

4918 DATA"ACTON TOWN", "ALDGRATE", "ALDGRATE  
EAST", "ALDMYCH", "ALPERTON", "HAMERSHAM"  
4920 DATA"ANGEL", "ARCHWAY", "ARNOS GROVE"  
"ARSENAL", "BAKER STREET", "BALHAM"  
4930 DATA"BANK", "BARBICAN", "BARKING", "BA  
RKINGSIDE", "BARONS COURT", "BAYSWATER"  
4940 DATA"BECONTREE", "BELSIZE PARK", "BET  
HNAL GREEN", "BLACKFRIARS"  
4950 DATA"BLACKHORSE ROAD", "BOND STREET",  
"BOROUGH", "BOSTON MANOR", "BOUNDS GREEN"  
4960 DATA"BOW ROAD", "BRENT CROSS", "BRIXT  
ON", "BROMLEY BY BOW", "BUCKHURST HILL"  
4970 DATA"BURNT OAK", "CALEDONIAN ROAD", "  
CAMDEN TOWN", "CANNON STREET"  
4980 DATA"CANNONS PARK", "CHALFONT & LATIM  
ER", "CHALK FARM", "CHANCERY LANE"  
4990 DATA"CHARING CROSS", "CHESHAM", "CHIS  
WELL", "CHISWICK PARK", "CHORLEWOOD"  
5000 DATA"CLAPHAM COMMON", "CLAPHAM NORTH  
", "CLAPHAM SOUTH", "COCKFOSTERS"  
5010 DATA"COLINDALE", "COLLIERS WOOD", "CO  
VENT GARDEN", "CROXLEY", "DAGENHAM EAST"  
5020 DATA"DAGENHAM HEATHWAY", "DEBDEN", "D  
OLLIS HILL", "DRAYTON PARK"  
5030 DATA"EALING BROADWAY", "EALING COMMO  
N", "EARLS COURT", "EAST ACTON", "EASTCOTE"

5040 DATA"EAST FINCHLEY", "EAST HAM", "EAS  
T PUTNEY", "EDGWARE", "EDGWARE ROAD (1)", "EAS  
5050 DATA"EDGWARE ROAD (2)", "ELEPHANT &  
CASTLE", "ELM PARK", "EMBAKMENT", "EPPING"  
5060 DATA"ESSEX ROAD", "EUSTON", "EUSTON E  
QUIRE", "FIRLÖP", "FHRRINGSDON"

5070 DATA"FINCHLEY CENTRAL", "FINCHLEY RO  
AD", "FINSBURY PARK", "FULHAM BROADWAY"  
5080 DATA"GANTS HILL", "GLOUCESTER ROAD",  
"GOLDERS GREEN", "GOLDMARK ROAD"

5090 DATA"GOODGE STREET", "GRANGE HILL", "  
GREAT PORTLAND STREET", "GREENFORD"

5100 DATA"GREEN PARK", "GUNNERSBURY", "HAI  
NAULT", "HAMMERSMITH", "HAMPSHED"

5110 DATA"HANGER LANE", "HARLESDEN", "HARR  
OW ON THE HILL", "HARROW & WELLDSTONE"

5120 DATA"HATTON CROSS", "HEATHROW TERMIN  
ALS 1,2,3", "HEATHROW TERMINAL 4"

5130 DATA"HENDON CENTRAL", "HIGH BARNET",  
"HIGHBURY & ISLINGTON", "HIGHGATE"

5140 DATA"HIGH STREET KENSINGTON", "HILLI  
NGDON", "HOLBORN", "HOLLAND PARK"

5150 DATA"HOLLOWAY ROAD", "HORNCHURCH", "H  
OUNGLOW CENTRAL", "HOUNGLOW EAST"

5160 DATA"HOUNGLOW WEST", "HYDE PARK CORN  
ER", "ICKENHAM", "KENNINGTON"

5170 DATA "KENSAL GREEN", "KENSINGTON (OLD MPID)", "KENTISH TOWN", "KENTON"  
5180 DATA "KEM GARDENS", "KILBURN", "KILBURN PARK", "KINGSBURY"  
5190 DATA "KINGS CROSS ST PANCRAS", "KNIGHTSBRIDGE", "LADBROKE GROVE"  
5200 DATA "LAMBETH NORTH", "LANCASTER GATE", "LATTIMER ROAD", "LEICESTER SQUARE"  
5210 DATA "LEYTON", "LEYTONSTONE", "LIVERPOOL STREET", "LONDON BRIDGE", "LOUGHTON"  
5220 DATA "MAIDA VALE", "MANOR HOUSE", "MANSION HOUSE", "MARBLE ARCH", "MARLYBONE"  
5230 DATA "MILE END", "MILL HILL EAST", "MOMUMENT", "MOORGATE", "MOOR PARK", "MORDEM"  
5240 DATA "MORNINGTON CRESCENT", "NEASDEN", "NEWBURY PARK", "NEW CROSS"  
5250 DATA "NEW CROSS GATE", "NORTH ACTON", "NORTH EALING", "NORTHFIELDS"  
5260 DATA "NORTH HARROW", "NORTHOLT", "NORTH MEALD", "NORTH WEMBLEY"  
5270 DATA "NORTHWICK PARK", "NORTHWOOD", "NORTHWOOD HILLS", "NOTTING HILL GATE"  
5280 DATA "OAKWOOD", "OLD STREET", "ONGAR", "OSTERLEY", "OVAL", "OXFORD CIRCUS"  
5290 DATA "PADDINGTON", "PARK ROYAL", "PARSONS GREEN", "PERIVALE"  
5300 DATA "PICCADILLY CIRCUS", "PIMLICO", "PINNER", "PLAISTOW", "PRESTON ROAD"

5310 DATA "PUTNEY BRIDGE", "QUEENSBURY", "QUEENS PARK", "QUEENSWAY"  
5320 DATA "RAVENS COURT PARK", "RAVENS LAKE", "REDBRIDGE", "REGENTS PARK"  
5330 DATA "RICHMOND", "RICKMANSWORTH", "RODING VALLEY", "ROTHERHITHE", "ROYAL OAK"  
5340 DATA "RUISLIP", "RUISLIP GARDENS", "RUISLIP MANOR", "RUSSELL SQUARE"  
5350 DATA "SEVEN SISTERS", "SHADWELL", "SHEPHERDS BUSH", "SHOREDITCH"  
5360 DATA "SLOANE SQUARE", "SNARESBROOK", "SOUTH EALING", "SOUTHFIELDS", "SOUTHGATE"  
5370 DATA "SOUTH HARROW", "SOUTH KENSINGTON", "SOUTH KENTON", "SOUTH RUISLIP"  
5380 DATA "SOUTH WIMLETON", "SOUTH WOODFORD", "STAMFORD BROOK", "STANMORE"  
5390 DATA "STEPNEY GREEN", "ST JAMES'S PARK", "ST JOHN'S WOOD", "STOCKWELL"  
5400 DATA "STONEBRIDGE PARK", "ST PAULS", "STRAITFORD", "SUDBURY HILL", "SUDBURY TOWN"  
5410 DATA "SURREY DOCKS", "SWISS COTTAGE", "TEMPLE", "THEYDON BOIS", "TOOTING BEC"  
5420 DATA "TOOTING BROADWAY", "TOTTENHAM COURT ROAD", "TOTTENHAM HALE"

5430 DATA"TOTTERIDGE & RHETSTONE", "TOWER  
 HILL", "TURNELL PARK", "TURNHAM GREEN"  
 5440 DATA"TURNPIKE LANE", "UPMINSTER", "UP  
 MINSTER BRIDGE", "UPNEY", "UPTON PARK"  
 5450 DATA"UXBRIDGE", "VAUXHALL", "VICTORIA  
 ", "WALTHAMSTON CENTRAL", "WHINSTEAD"  
 5460 DATA"WAPPING", "WARREN STREET", "WARM  
 ICK AVENUE", "WATERLOO", "WATFORD"  
 5470 DATA"MEMBLEY CENTRAL", "MEMBLEY PARK  
 ", "WEST ACTON", "WESTBOURNE PARK"  
 5480 DATA"WEST BROMPTON", "WEST FINCHLEY"  
 ", "WEST HAM", "WEST HAMPESTEAD"  
 5490 DATA"WEST HARROW", "WEST KENSINGTON"  
 ", "WESTMINSTER", "WEST RUISLIP"  
 5500 DATA"WHITECHAPEL", "WHITE CITY", "WIL  
 LESDEN GREEN", "WILLESDEN JUNCTION"  
 5510 DATA"WIMBELEDON", "WIMBELEDON PARK", "W  
 OODFORD", "WOODGREEN", "WOODSIDE PARK"  
 5520 DATA"0-", "1-", "2-", "3-", "4-", "5-", "  
 6-", "7-", "8-", "9-"  
 5530 DATA"A-", "B-", "C-", "D-", "E-", "F-", "  
 G-", "H-", "I-", "J-"  
 5540 DATA"K-", "L-"

END OF KEVIN WHEALS

UNDERGROUND PROGRAM

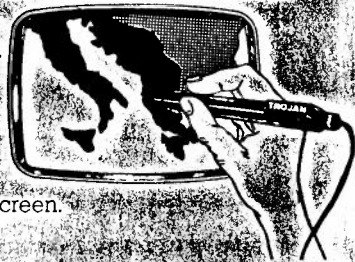
I HOPE ITS USEFULL

*MORE NEW PROGS TO COME !*

# CADMASTER™

## THE ULTIMATE GRAPHICS PACK

SUPERB GRAPHICS SOFTWARE  
PLUS  
A QUALITY LIGHT PEN



Discover the exciting world of creating your own graphics on screen.

Look at these options:—

☆ — DISC OPTIONAL EXTRA # — MICRO DRIVE COMPATIBLE S — SOLID COLOURS C — CASSETTE	AMSTRAD CPC464/664/6128 COLOUR MONITOR	COMMODORE 64/128	PLUS4	C16	SPECTRUM +3	SPECTRUM 48K & + +1	AMSTRAD PCW 8256/8512
FREEHAND DRAW	✓	✓	✓	✓	✓	✓	✓
DRAW BOX	✓	✓	✓	✓	✓	✓	✓
DRAW CIRCLE	✓	✓	✓	✓	✓	✓	✓
DRAW LINE	✓	✓	✓	✓	✓	✓	✓
DRAW TRIANGLE	✓	✓	✓	✓	✓	✓	✓
DRAW RAYS	✓	✓	✓	✓	✓	✓	✓
PEN THICKNESSES	1	5	5	1	4	4	4
PEN QUILLS	—	3	3	—	2	2	2
PAINT BRUSH	—	✓	✓	—	✓	✓	✓
TEXT	✓	✓	✓	—	✓	✓	✓
PIN POINT ACCURACY	✓	✓	✓	✓	✓	✓	✓
ACTIVE BANDING	—	✓	✓	—	✓	✓	✓
COPY FUNCTION	✓	✓	✓	—	✓	✓	✓
WASH	—	✓	✓	—	✓	✓	✓
COLOURS	27	16	121	121	8	8	8
FILL	✓	✓	✓	✓	✓	✓	✓
FILL PATTERNS	S	11+S	11+S	S	7+S	7+S	7+S
ERASE FUNCTION	—	✓	✓	—	✓	✓	✓
SAVE SCREEN	✓	✓	✓	✓	✓	✓	✓
PRINTER DUMP	✓	✓	✓	✓	✓	✓	✓
PROGRAM FORMAT	C★	C★	C★	C★	3* DISK	C#	3* DISK
RETAIL PRICE	£19.95	£19.95	£19.95	£19.95	£23.95	£19.95	£23.95

PLEASE ASK FOR LEAFLET.  
THERE ARE FAR TOO MANY OPTIONS  
TO SHOW HERE

This powerful PROGRAM + a QUALITY LIGHT PEN and an INSTRUCTION BOOKLET in one reasonably priced package.

Easy to use by all ages for creating colourful pictures or technical drawings.

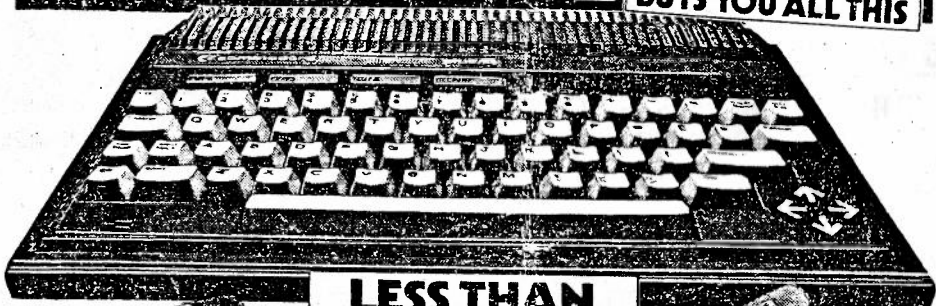
Full back-up service from the manufacturers.

# TROJAN

Do You REMEMBER THIS Ad?

# THE COMPUTER SCOOP OF THE DECADE

ONLY £99.99  
BUYS YOU ALL THIS



## LESS THAN HALF PRICE COMMODORE PLUS 4 COMPUTER

The ideal first computer for home or business. Just look what this remarkable Greens package includes.

### COMMODORE PLUS 4 COMPUTER

The advanced business-and-pleasure system that's as easy to use as a child's toy. Computer List price £149.99

- \* **BUILT-IN 64k MEMORY**  
Twice the size of other computers costing this much.
- \* **BUILT-IN WORD PROCESSING**  
No other computer at the price offers word processing as a standard function.
- \* **BUILT-IN FILE MANAGEMENT**  
Usually only found on high priced business systems
- \* **BUILT-IN SPREADSHEET**  
A vital business tool - unknown on computers of this price.
- \* **BUILT-IN BUSINESS GRAPHICS**  
121 versatile colours. Most £100 computers can't even get into double figures!
- \* **BUILT-IN SIMPLICITY**

The Plus 4 is designed to make your life as easy as possible. Uses the popular BASIC language. Special HELP key quickly points out mistakes. And four separate cursor keys give swift, simple control.

Get the best of these features with a CBM Disc Drive

COMPLETE PACKAGE WAS £264.83

# ALL FOR £ 99.99



## PLUS DATA RECORDER List price £44.95

A vital add-on! The ideal way to store data - and access huge quantities of software.

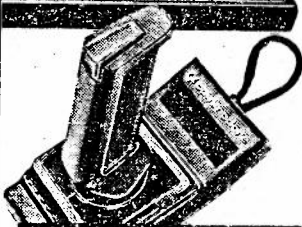


## PLUS

### 10 GREAT GAMES CASSETTES

Take a break from business with these tremendous free games including Mayhem, Treasure Island and Harbour Attack.

List price £5.99 each.  
Total value £59.90.



## PLUS JOYSTICK T1341 List price £9.99

Purpose-designed for the Plus 4. Contoured for comfort, easy action and precise control.



## PLUS Easy-to-follow User Manual, Software Guides and Catalogue.

UP TO £1,000 NO DEPOSIT INSTANT CREDIT

To spend instantly on a Debenhams charge card - subject to acceptance. APR 34.4% variable, reducing to 29.8% when payment made by direct debit.



# GREENS AT DEBENHAMS BRITAIN'S BIGGEST ELECTRICAL DEPARTMENTS

30 SENT IN BY ANDY TANG, LONDON



### Welcome

Welcome to this the first edition of our catalogue of Public Domain Software for the Commodore Plus 4. Enjoy browsing through it & we hope you will find some useful programs.

### The Plus 4 is Dead - Long live the Plus 4!

So you thought the Plus 4 was dead did you? No programs available? We hope to prove to you that this isn't the case. The current catalogue contains almost 30 disks full of programs for your machine. So don't throw your Plus 4 in the bin just yet!

### Kingsway Computer

Services reach the computers that other suppliers don't touch! As far as we are aware we are the only Computer company offering Public Domain for the Plus 4 in the UK.

### What is Public Domain Software?

Public Domain (PD for short) Software is software that has been made freely available to the public by the authors. The authors allow their programs to be freely copied & distributed. The charge we make covers our promotion & distribution costs and includes a small service charge. We do not sell the software.

### Using the Catalogue

Each disk has a unique name. This consists of the word PLUS followed by a number. Each disk is also given a descriptive title. These summarize the contents of the disk. They do not always mean that all the programs will be of one sort, but just that the majority of programs fall into that particular category. The list of names which follow the disk name & description are the actual files on the disk.

### Ordering Disks

To order a disk just write down its number, for example, "PLUS 6". Please always include the "PLUS" before the number as we cater for a few other computers & we won't know which computer you have.

Please use the order form provided. If you didn't receive an order form or have misplaced it, write your order clearly on a piece of paper. Don't forget your name & address.

### Guarantee

Please note that as the software is Public Domain & we are not selling it we cannot guarantee the workability or suitability of any particular program for your needs or equipment. Nor can we accept any liability for any loss

or damage that might occur to your equipment or other software as a result of using this software. This is a standard sort of disclaimer made by all software houses.

What we do guarantee is the disk on which the software comes. All disks are guaranteed for a period of 28 days from the date of receipt. If the disk proves to be defective (eg it has bad sectors), or if the disk you receive is not the one you ordered it will be replaced FREE of charge.

### Prices

Disks are priced according to quantity ordered; 1-4 Disks \$4.00 each 5 Disks or more \$3.75 each

This includes the disk itself, postage & VAT.

### Special Offer!

If you order 10 disks at any one time you may take another disk of your choice FREE of charge.

Please make all cheques or postal orders payable to Kingsway Computer Services. We normally despatch orders within 2 working days of receipt.

## Did You Know

That we at Kingsway Computer Services also provide Public Domain Software & Shareware for a number of other computers?

Computers currently supported include:

**IBM PC & Compatibles (including all Amstrad PCs)**

**Atari ST**

**Commodore Amiga**

**Apple Macintosh**

**Commodore C64**

**Apple II range**

If you have any of the above computers why not send for a FREE catalogue today? Please enclose SAE & state computer type.

## Disks

10 x 5.25" DS/DD Disks with Labels & Sleeves

**£5.00 post free with Public Domain disk orders otherwise add 50p post & packing**



There are also programs dealing with percentages, bases, fractions and more.

**PLUS 37 Games & Others**

This disk contains largely games, but with one or two others thrown in for good measure.

- B.L. RUN ME FIRST
- BOWLING LEAGUE
- BOWLING REPORT
- B.C. DIVIDE
- B.C. FRACTIONS
- B.C. MULTIPLY
- B.C. PERCENT
- BRAIN CRANE X
- BRAIN CRANE +
- BRAIN CRANE -
- BRAIN CRANE /
- BONDS
- BOMB ADDITION
- BEADS IN A JAR
- BASE CHANGE
- BALANCE
- BIG TIME/ALARM
- MENU
- TWENTY QUEST
- 200QUESTFE

**PLUS 36 Assorted**

A collection of many different types of programs including: games, utilities, educational, and personal productivity.

- READ ME FIRST
- MENU
- DOE PAGER
- ADVICE PROGRAM
- ADVICE PROGRAM INST
- KURBS RUBE
- LOCKSMITH
- NEW TREK
- NEW TREK INSTR.
- TWO TO TEN
- 123 DIR PRINTER
- CALENDAR P.P.'S
- CALENDAR FILE
- CONDOR 1000
- CHECK WRITER
- BALANCES
- LABEL LETTER 1,6
- LABELS 1-1000
- SHAFTS
- STATES OF UNION
- PIVOT BEARINGS
- BIRTHDAY CARD
- ODE
- SHUTTLE
- MERRIMAN.DOC
- MERRIMAN.MGR 2.6
- MERRIMAN.MGR 3.2
- MM/CALLSIGNS

**PLUS 1 Assortment**

The 40 files on this disk provide an assortment of different programs & utilities including: disk & printer utilities, as well as an assortment of games & educational programs. Programs included are:

- ALPHA DIRECTORY
- ALPHABETIC PRINT
- BACKUP
- REGUL-TIMER
- CARD SNAP
- CARD UTILITY
- D&D PART ONE
- DEVELOP.B&W.FLM
- DIR ORDER
- DIR.LOOC.TXT
- DSK.DOCTOR
- DOC.READER
- DRAW.POKER
- EAGLE
- ENGLISH GRAMMER
- FILE MGR.FIX
- GUNNER
- HORSES
- HEAD.CHANGE
- INFO.1660.2
- JOGGING.RECORD
- LOAD.ADDR
- MAGIC SQUARE
- MASTERMIND 1
- MATH.Q
- MAZE
- NO-HEADBRAG
- POSTER.PRINTER
- SCREEN.VAR.DUMP
- SEEFILE
- SEC-2.PRG
- SYDISH
- STAR.LOCATOR
- STOP.KNOCK
- UNSCRATCH
- UTILITY.FILE
- WORD.FIND
- WORD.FIND.PUZZLE
- WORDMARI

**PLUS 2 Home Accountant +**

This disk contains 39 items which are mostly

- ACCOUNTANT
- ACCOUNTANT.1
- OHMS.LAW
- OSERO
- PROGRAM.INFO
- PROPERTY.EVAL
- QUADRATIC.EQU.
- RENT.OR.BUY
- SINNERS
- SPELL
- \$PELL.1/15
- SQUARE.ROOT.FIND
- TEMP.CONVERT
- TITLE.PAGE
- WUMPUIS

**PLUS 3 Education**

This disk contains 39 items which are mostly

- ANNUNITY
- AVERAGE.GROWTH
- BILLARDS
- BLACK.JACK
- CAR.COST.MILE
- CARD.SNAP
- CARD.UTILITY
- CHANGE.TITLE
- COIL.DESIGN
- DAYS.TWEN.DATES
- DISK.PRINTER
- DRAW.POKER
- EMPLOYER.TAX
- FAMILY.MYSTERY
- GOLF.TOWERS
- GUNNER
- HORSES
- DEAL.MASS
- LIST.ME
- LOAD.ADDRESS
- LOTTERY.NUMS
- LOTTO.6/49
- MAG.INDEX
- MORTGAGE
- MY.ACCOUNTANT.D
- MY.ACCOUNTANT.1
- OHMS.LAW
- OSERO
- PROGRAM.INFO
- PROPERTY.EVAL
- QUADRATIC.EQU.
- RENT.OR.BUY
- SINNERS
- SPELL
- \$PELL.1/15
- SQUARE.ROOT.FIND
- TEMP.CONVERT
- TITLE.PAGE
- WUMPUIS

**PLUS 4 Assortment**

Another collection of miscellaneous programs covering such areas as personal accounts, address book, education, utilities, mathematics & games!

- ADDRESS BOOK
- AFRICA AND ASIA
- BAGELS
- BARRICADE
- BIG TIME
- CHECKBOOK 6
- CHECKS OUT 1987
- CHEMIST
- CLEAR FILE 1987
- CURRENT BALANCE
- DENSITY
- DISKUT
- DRIVE CLEAN



**DECOMPOSITION**  
 BALANCE CHEM  
 DERIV POLY  
 DICE THROW  
 DRILL  
 DRILL S1  
 DRILLS  
 ELLIPSE TRANS

**PLUS 24 Education**

**- Maths**  
 Contains many educational programs dealing with mathematics.

**CENTRAL COMICS**  
 PRIME NUMBER  
 PRIME-FACT  
 PROBABILITY  
 QUIZ ADD  
 QUIZ MULTI  
 RESULTANTS  
 ROLLS THE ONE  
 ROOT FINDER  
 ROOTS QUIZ  
 SAUCER MULTI  
 SHAPES  
 SIG-FIGS  
 SIGNIFICANT DIG  
 SIMPLE SUBST  
 SKEW  
 SLOPE & INI

**PLUS 25 Education**

**Provides multimedial educational programs.**  
 SPELL ERROR 4  
 SPELL ERROR 8  
 SPELL ERROR 9  
 SHYPHEN  
 THYPHEN  
 HYPHENADA  
 T-SPILL  
 5-SPILL  
 SPEDUDA  
 SCHOOL MABRM  
 SCRAMBLE 4  
 SCRAMBLE 5  
 PARTS SPEECH  
 MM MUGS 2WM  
 MM MUGS 3WM  
 MM PINGUAN  
 MM PINGUAN 2  
 SHAKE TIME  
 STAR PATTERNS

**PLUS 26 Education**

**- Language**  
 A collection of programs dealing with aspects of the English language.  
 MM V8 FORM 2  
 MM V8 FORM 3  
 MM V8 FORM 4  
 MM V8 FORM 5  
 MM V8 FORM 6  
 MM V8 FORM 7  
 MM V8 FORM 8  
 MM V8 FORM 9  
 MM WORD MEANS

**PLUS 27 Education**

**- Language**  
 This disk is largely concerned with spelling & related subjects.  
 NEW TACHSTO  
 READER  
 REMEMBERING  
 RHYMECONC  
 SPELL ERROR 4  
 SPELL ERROR 8  
 SPELL ERROR 9  
 SHYPHEN  
 THYPHEN  
 HYPHENADA  
 T-SPILL  
 5-SPILL  
 SPEDUDA  
 SCHOOL MABRM  
 SCRAMBLE 4  
 SCRAMBLE 5  
 PARTS SPEECH

**PLUS 28 Education**

**- Science**  
 This disk deals with various aspects of Chemistry & Physics.  
 ACTINUM DECA  
 AN VEG OR MIN

**PLUS 29 Utilities & Applications**

**Applications**  
 An assortment of utilities for printing, data management, etc. The disk also contains a general-use program & other applications.  
 PEPOR CHRT  
 FMTY GP SHEET  
 1541 HEAD SAVER  
 CALENDAR  
 COMMA SENSE  
 DIR PRINT BL  
 DIR FODLER  
 DEK INTEROGATE  
 DEK RENAME  
 DUST 1-9  
 FILE TO PRINT  
 FONTASIA  
 GAP REMOVER  
 GEMINI DIR PRINT  
 GEMINI SETUP  
 HARD COPY ERROR  
 HEADLINKAMENT  
 HEZ DUAP  
 HOUSEKEEPER  
 THE CONVERTER  
 JACKET FRAME  
 LABELAVI  
 LUREAVI  
 MEMO FILE  
 MEMO CONVETS  
 MERIC CONVETS  
 PLEINY  
 PROVERSAL  
 TAX RECORDS  
 TAXFILE 98  
 THE PCK

**PLUS 30 Maths & History**

The programs on this disk are mainly con-

**MECHANICS**

AMMUR & ALI  
 BALANCE CHEM  
 BERNIE TOWER  
 BOHR ATOM  
 BOTES LUY  
 CHEMEXPERIM  
 CHANGE  
 CHEMIST  
 CHEMIST QUIZ

**PLUS 8 Maths Education**

All 29 files on this disk are concerned with maths.  
 MATH FACTS  
 ADD & SUB  
 49 X 51  
 35 X 35  
 MUL BY 11  
 MUL BY 25  
 COMBINATION  
 BAYS  
 MEASUREMENT  
 SEQUENCES  
 PERCENTAGE  
 PERCENTS  
 PERCENTS  
 METRIC  
 DISCOUNTS  
 ROMAN  
 SQUARE ROOTS  
 FRACT/DEC  
 PERMETER  
 DISTRIBUTIVE  
 ADD SEQUENCES

**PLUS 10**

**Assortment**  
 Contains 26 files providing educational programs, games, disk utilities, & programming aids.  
 AFO  
 ANORTIZE  
 BASSEBALL  
 BASEBALL  
 BATTERS  
 BATTERS CARE  
 BUBBLE GUM  
 BUBBLE GUM  
 FRACTION ACTION  
 FRACTION ACTION  
 HANGMAN  
 HANGMAN  
 DICK MASTER  
 INDEX SHEET SORT  
 JUBBO JET LANDER  
 LABRINH  
 LOAD ADDRESS  
 PHAROAH NEEDS  
 DICK EXAMINE  
 POKER CONVERTER  
 REM HIGHLIGHTER  
 SORCERERS CASTLE

**PLUS 11 Education**

This disk contains the subjects math, flags of the world among many more. It also provides a version of the PORTH programming language & a graphical menu.  
 DATE FINDER  
 DECISION MAKER  
 ENERGY SAVER  
 EVENT CALENDAR  
 GAS LAW SOLVER  
 MARKS-DSK  
 MERGER  
 PLUS A LABEL  
 SORT DEMO  
 TEST TYPE  
 TINY FORTH 44  
 TINY FORTH INST  
 TYPEWRITER DISK  
 TYPEWRITER TAPE  
 SUPER MATH  
 ADO  
 SUB  
 AVERAGES  
 DIV  
 MULTI  
 BOOT FLAGS  
 USA  
 CANADA  
 COLOMBIA  
 ETHIOPIA  
 GERMANY  
 GERMANY  
 NETHERLANDS  
 OHANI  
 POLAND  
 SAN MARIN  
 SWEDEN  
 SWITZ  
 THAI  
 VET  
 AIR TRIVA  
 AIR TRIVA 2  
 AUTO COLOR BARS  
 BARBROW NIN ESC  
 CHORES  
 COLOR CODES  
 COLOR CODES 2

**COLOR CODES**  
**ENGLISH GRAMMER**  
 FORMAT  
 HANGMATH/O'H  
 MONEY PLANNER  
 MYSTERY #1  
 NUMINT  
 HISTOGRAMS  
 PROJ-PILOT  
 RATIONAL  
 READABILITY  
 SINEQ SOLVER  
 SOLAR SYSTEM  
 SPEED READ  
 TEMP CONVERSION  
 WORD LADDER

**PLUS 13 Education**

This disk contains 15 files dealing with the history of computers, computer concepts, the metric system & others.

COMP HIST QUIZ  
 COMPR CONCEPTS  
 DISK CMD  
 DISK EDUCATION  
 ELEMENT VOVENCLT  
 FEATURES QUIZ  
 GAS LAW SOLVER  
 HEX DEC  
 HEX DEMO  
 HYPO AUTO  
 LIGHT MEIER  
 METRIC STANDARD  
 PRINT SORT  
 RND GENERATOR  
 SIMULATION

**PLUS 12 Education & Finance**

37 files the majority of which are educational & financial programs. There are also some games and some utilities.

ALPHA INDEX  
 AMORITE  
 BACYGAMMON  
 BAIN READER  
 BASIC STATISTICS  
 BEST FITELEAST  
 BLOCKS FREE  
 CAL DRIVING TEST  
 CLASS PROGRAM  
 HISTORY 101  
 COLUMN RIGHT  
 DATE CALCULATOR  
 DIR FILE SORT  
 DIR MAP  
 ELEMENT DRILL  
 FARM GAME  
 FFT  
 FINANCE CALC  
 FNID NOM INT  
 FRACTION GAME  
 HOMOXYM MACHINE  
 INCOMETAX ADV  
 INVESTMENT CALC  
 INVESTMENT F.V.  
 JOITO  
 JULIAN CALENDAR  
 LABEL MAKER  
 LISTENER  
 LOCK UNLOCK  
 LONG EXPRESSION  
 MARELEAT

**PLUS 14 Education**

- Electricity  
 This disk provides programs which deal with various aspects of electricity & electronics.

CIRCUIT 3  
 CIRCUIT 4  
 DFW RESISTANCE  
 ELEC PRACTICES  
 FUSE CALCULATION  
 OHM'S LAW  
 PH PROBLEMS  
 PHOTOSYNTHESIS RESTORERS  
 REG PWR SUP  
 S.I. CONVERSIONS  
 STOCH CALCULATE

**PLUS 15 Education**

Various educational programs dealing with math, geography & physics subjects.

JOITO  
 KING JUI ADVENTR  
 KINGSBURND 3  
 MASTERBURNS 5  
 MILLE BOURAINS INK  
 MILLE BOURAINS PR  
 MOTO  
 HANGMAN 2  
 JOITO  
 KING JUI ADVENTR  
 KINGSBURND 3  
 MASTERBURNS 5  
 MILLE BOURAINS INK  
 MILLE BOURAINS PR

**PLUS 18 Assorted files.**

16 assorted files.

AFO  
 CO-ORD DST.  
 HOME ENERGY  
 WORLD SEARCH I  
 ARROWJ  
 COPY D FILES  
 PRGM LISTER  
 PGM TESTS  
 TABL111  
 DUM 5.0  
 BELIEF  
 ENERGY WORKBOOK  
 CHECK DISK  
 HAMLET  
 SNOWY DAY NOUNS  
 INFLATION CALC

**PLUS 19 Education**

The 26 files on this disk provide an assortment of educational programs.

BEADS  
 ALGEBRAIC VECTOR  
 GENERAL  
 LISTIME DISK MAP  
 NEW DISK NAME  
 OTHELLO/2  
 PORTFOLIO  
 PRINTER TEST  
 GUEZ BUILDER  
 DRUNKARD'S WALK  
 FACTOR BY DECOMP  
 FAMILY  
 HANGMURABI  
 HANG MATH 2  
 LABYRINTH+  
 NAMING COMPOUNDS  
 OREGON OR BUST  
 PETALS  
 PLACE VALUES  
 PRACTICE  
 REFERENCIALLOON  
 SPRTS ENDING  
 STAR LOCALOR  
 STORY PROBLEMS  
 SUBJECTS  
 TRINOM PRACTICE

**PLUS 20 Programming & Disk Utilities**

STATISTICS  
 VOCABULARY 3  
 WEIRD NONSENSE

This disk provides a number of programs which will be useful to those interested in programming their Plus 4 drive. There is also a large adventure game & a version of the board game Orhe lo & more!!

ANTONYM CONCENR  
 BAL-CHEMICAL EQU  
 BAM CHART  
 BASE CONV. ALT  
 BLOCKS FREE  
 BOO.ALG.LOG.RULES  
 COMBINATION WARS  
 COPY D FILES  
 DENSITY CALC  
 DIR A SST  
 DISK ID READ  
 DISK SPINNER  
 DISK LISTER  
 DISK MAP  
 DONATION FILES  
 GENERAL  
 LISTIME DISK MAP  
 NEW DISK NAME  
 OTHELLO/2  
 PORTFOLIO  
 PRINTER TEST  
 GUEZ BUILDER  
 DRUNKARD'S WALK  
 FACTOR BY DECOMP  
 FAMILY  
 HANGMURABI  
 HANG MATH 2  
 LABYRINTH+  
 NAMING COMPOUNDS  
 OREGON OR BUST  
 PETALS  
 PLACE VALUES  
 PRACTICE  
 REFERENCIALLOON  
 SPRTS ENDING  
 STAR LOCALOR  
 STORY PROBLEMS  
 SUBJECTS  
 TRINOM PRACTICE

**PLUS 21 Games**

This disk is packed full of various types of games including Adventures, quizzes & puzzles. There are one or two other programs to boot!

CHEK-BOOK  
 CONFER GUIDE  
 D&D PART TWO  
 HANGMAN 2  
 JOITO  
 KING JUI ADVENTR  
 KINGSBURND 3  
 MASTERBURNS 5  
 MILLE BOURAINS INK  
 MILLE BOURAINS PR

**PLUS 23 Education**

This disk includes a number of programs which introduce basic mathematical to children as well as some other educational programs.

STATISTICS  
 VOCABULARY 3  
 WEIRD NONSENSE