

July 1984

C YOUR Commodore

*How to
track down
and use your 64's
hidden memory*

*Great games for the
unexpanded VIC-20*

*Latest Commodore
software star-rated
for you*

*Be a hero with our
Commodore 64 game*



FREE with Personal
Computing Today

ANIROG



BONGO

Flight Path 737



Space Pilot



Bongo

Enjoy the hilarious antics of the comical mouse as he collects the 108 Diamonds. He climbs ladders, slides down chutes, uses teleporters and trampolines to jump across the fields. Multi screen game with three levels of difficulty.
Commodore 64 £7.95 - Vc 20 £7.95 - Spectrum £5.50

Space Pilot

Realize your dreams of being king of the open skies. Fly your aircraft into uncharted dog fights with enemy fighters. Prove how well you can handle your craft. Five stages of tough engagements.
Commodore 64 £7.95 - Spectrum £5.50

Flight Path 737

An advanced Pilot Trainer. Written for a flight simulator instructor and pilot. Passover Pilot's eye view.
Commodore 64 £7.95 - Vc 20 £7.95

Also available on Disk at £9.95

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Two very different games for the unexpanded VIC-20 by Matthew Solly. In the first you're under siege and the second could make you rich . . .

Castle Siege

YOU ARE the last survivor in the castle and your only responsibility is the safe side of rock.

You are under attack from the enemy who are scaling the castle wall. You must drop the rocks to dislodge them. If they reach the top the game is over. How long will you survive?

The control keys are: Z left, X right and space bar to drop the rocks.

• Castle Siege is in two parts. Type in Listing 1, which defines the characters, ROM and then MCR. Now type in Listing 2. See also note at bottom.

How it works

10-100 main game loop
1000-1500 initialise variables and strings
2000-2500 instructions
3000-3500 POKE on other side of screen
3500-4000 POKE on other side of screen
4000-4500 theta rock
5000-5500 PRINT enemy
6000-6500 game over
7000-7500 rock hit enemy routine
8000-8500 pick up rock routine

Variables

EH(), EL() attacking enemy
E defender
R rock
R# timing rock
RO, DE test for rock and defender
E number of enemies
SA sound channel
CO colour location
T time
BT best time
W wall location
L, Q loops
RE () test for enemy at top

Crown and Anchor

THIS GAME is played with three dice which are displayed on the screen.

The amount of money you have is displayed in the top left

Listing 1 — Defines characters for Castle Siege

```

1000 REM *****
1010 REM *****
1020 REM *****
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1070 REM *****
1080 REM *****
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9930 REM *****
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9970 REM *****
9980 REM *****
9990 REM *****
10000 REM *****

```

hand corner. You start with £100 and are prompted with the message "place bet". You then type in how much you wish to bet — not more money than you have!

After pressing RETURN you are prompted with another message "bank". Type in which side of the dice you expect to be showing after the computer has shaken them. The computer will

then throw the dice and the outcome will be printed on the screen.

If one of the dice shows the side you banked you get double your stake money back. If two of the dice show your side you get triple your stake money back, and if all three dice show the side you banked you get four times your stake money returned. If none of them show your side you lose your stake.

How it works

10-100 main game loop
1000-1500 initialise variables and strings
2000-2500 instructions
3000-3500 print credit
4000-4500 theta

Variables

D() dice
P() position of numbers on dice
R number of dice right
T total credit
CO colour location

Defend your castle... and try your luck with dice



Listing 2 — Castle Siege, main game

```

*****
          1
*****
          2
*****
          3
*****
          4
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          5
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          6
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          7
*****
          8
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          9
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Listing 3 — Crown and Anchor

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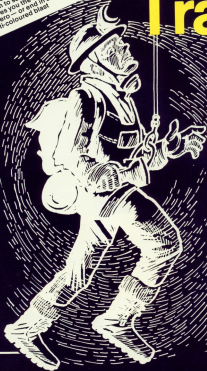
```

We have inserted **REMLs** in the lines above those in which Commodore control characters appear in the listings. These are only for your guidance and should not be entered. Remember that lines in some listings may not fit unless you use abbreviations for the BASIC keywords — you'll find them in your manual.

PROGRAM

Pathfinders are doomed unless you can get them to safety. Thomas Tumbull gives you the chance to be a hero — or end in a multi-coloured blast

Trap



oped!

When typing in this listing, you'll find REMs above lines containing control characters. These REMs are only for your guidance and should not be entered. And remember to abbreviate BASIC keywords — there's a list in your manual. Some lines may not fit without abbreviations. And it's quicker to type them in...

```

10000 REM *****
10001 REM *****
10002 REM *****
10003 REM *****
10004 REM *****
10005 REM *****
10006 REM *****
10007 REM *****
10008 REM *****
10009 REM *****
10010 REM *****
10011 REM *****
10012 REM *****
10013 REM *****
10014 REM *****
10015 REM *****
10016 REM *****
10017 REM *****
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10081 REM *****
10082 REM *****
10083 REM *****
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10085 REM *****
10086 REM *****
10087 REM *****
10088 REM *****
10089 REM *****
10090 REM *****
10091 REM *****
10092 REM *****
10093 REM *****
10094 REM *****
10095 REM *****
10096 REM *****
10097 REM *****
10098 REM *****
10099 REM *****
10100 REM *****

```

CAVERS are trapped deep underground — and they're relying on you and your rescue craft.

You must steer your way through the tunnels, avoiding the stalagmites and the sides, into a large cavern.

There you see the potatoes signaling with a lamp, a flashing sprite which also changes shape due to a kind of BASIC interrupt.

Touch the lamp with your craft and a bell rings, indicating the first part of your mission is complete. Now you and the rescued potatoes must reach safety.

This time you use the right hand tunnel and touch your craft against a sprite with the word "winners" written inside it. This reports your time score to the table.

Don't touch this sprite on the way in — it will be ignored until you have reached the cavern.

Touching any other objects will result in a multi-colored explosion, complete with the sound of the blast.

The game works with the joystick in port 2 and these are the controls:



The fire button is used to restart the game and to give instant slow speed.

You will find that the response to the joystick is instant, even though the controls in lines 1 to 25 are written in BASIC.

All the Commodore 64 feeds sub-routines to searching the numbers from zero. I placed this routine at the beginning so it finds the routine and acts on it quickly.

How it works

- 1-25 main joystick and control code
- 27-28 near memory and store sprites and user-defined graphics
- 36-117 main section: variables, on screen and moves them
- 128-129 theme tune music DATA
- 130-410 user-defined graphics DATA
- 5000-5110 top 10 time table — a high score table for the 10 best times
- 7000-8750 sprite DATA
- 9000-9015 bell sound effect
- 10000-10020 explosion effect
- 20000-25000 cave cavern routine
- 30000-30075 winner sprite DATA
- 40000-40100 win and display routine
- 48000-48150 instructions
- 50000-50070 routine to play flower music
- 60000 number high-resolution colour routine

Will you survive to rescue the cavers?

Find and use your 64's hidden memory



ONE OF the aspects which separates the Commodore 64 from the "also rans" is its large memory. While it is true that only about 25K is accessible from BASIC, with the aid of a few short routines, you will have ready access to around 50K.

First, let me ask some questions:

- Are you fed up with converting your machine code routines or blocks of data into lengthy BASIC loaders (similar to listing 2)?
- Are you interested in simple animation or do you wish to have access to several screens of data?
- Do you wish that you had a few kilobytes of protected data area for your adventure or simulation?
- Do you want to move blocks of data around rapidly and easily?
- Are you just an enthusiastic dabbler?

If you answer yes to any of these questions (then read on). Before launching into description of the routines, it is necessary to describe how RAM is organized and controlled on the 64.

Consider Figure 1. The only obvious parts of RAM available for use are the BASIC area and the spare area. So where is the rest of the RAM?

The answer, hiding behind the ROMs and the I/O areas. Any address in these areas is shared by both RAM and ROM or I/O. The catch is that a value POKED to an address will be put into the RAM but a READ will reflect the value in ROM, not RAM. Fortunately, the 6410 pro-

hexadecimal	decimal	size of RAM	usage
\$0000-\$03FF	0-1024	1024	system
\$0400-\$07FF	1024-2047	1024	video memory
\$0800-\$97FF	2048-40959	38912	BASIC area
\$A000-\$BFFF	40960-49151	8192	BASIC ROM
\$C000-\$C7FF	49152-53247	4096	spare RAM
\$D000-\$DFFF	53248-57343	4096	I/O colour RAM
\$E000-\$FFFF	57344-65535	8192	Kernal ROM

• Figure 1 — Commodore 64 general memory map

There's much more RAM than you might have thought tucked away in the Commodore 64. Allen Weiss shows where it is and how to make it work for you.

cessor has an input/output control register at location 1. This location controls a whole handful of functions, as Figure 2 indicates. By setting the correct bit to zero, the ROM area controlled by that bit will be switched out and the RAM will become available for use. If the bit is set, the ROM is switched back in.

bit	function
0	switch for basic ROM
1	switch for Kernal ROM
2	switch for I/O area
3	cassette write line
4	cassette switch sense
5	cassette motor control

• Figure 2 — the function of location 1

Warning: Any attempt to switch out ROM by POKING values into location 1 from BASIC will cause the machine to crash.

The routines described here use the switching out of ROMs to give you easy access to about 20K from BASIC.

Listing 1 gives the source code for the routines. I've included this since you may prefer to extract portions or modify it to suit your own purposes.

The first routine is called `POORSAVE`. This routine will SAVE a specified block of memory to cassette or disk. Due to certain problems with saving with the interrupts disabled, the routine will not SAVE the block behind \$D000 to \$FFFF. The syntax is simple: SYS 49:52 "filename", device:system:address:rd address



where Device is 1 for cassette or 8 for disk, etc. = 2

As an example, to SAVE the BASIC ROM to disc use:
**SAVE 49152, "BASIC
 ROM".8,1074088,1074088-1**

Location 1000 is used as a flag to determine whether you want to save the ROM under the BASIC ROM or not. A zero value will leave the ROM alone, a nonzero value will switch the ROM out.

Incidentally, if you precede the above example with **POKE(1000,1)** then you will SAVE the RAM under the ROM, not the ROM. You will, however, get a LOAD error when you request the saved ROM (unless you have problems with your cassette), so can ignore the error.

Note: Any programs saved with blockmove must be loaded using the command:
LOAD "device,1"

otherwise it will not LOAD

into the correct place.

As mentioned earlier, you cannot PEEK the ROM areas. The next routine, named **Blockout**, will do this job. The syntax is:

**Blockout start address,
 address**

the contents of the address will be returned in location 9999. This routine will work on all buses.

The RAM under the PCMs offers great possibilities as virtual storage for animation or databases. The next command **Blockmove** is included by several such applications. Quite simply, blockmove will take a specified block of memory contents and put it at a specified location. The syntax is:
Blockmove start address,

where as is the start address of the block

to is the finish address of the block

ds is the destination address

Demonstrations 1 and 2 use this command to show you how to create multiple

screens for data or animation. As with **blockmove**, a flag is available to decide which

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1000: REM *****
1001: REM *****
1002: REM *****
1003: REM *****
1004: REM *****
1005: REM *****
1006: REM *****
1007: REM *****
1008: REM *****
1009: REM *****
1010: REM *****
1011: REM *****
1012: REM *****
1013: REM *****
1014: REM *****
1015: REM *****
1016: REM *****
1017: REM *****
1018: REM *****
1019: REM *****
1020: REM *****
1021: REM *****
1022: REM *****
1023: REM *****
1024: REM *****
1025: REM *****
1026: REM *****
1027: REM *****
1028: REM *****
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1031: REM *****
1032: REM *****
1033: REM *****
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1037: REM *****
1038: REM *****
1039: REM *****
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1100: REM *****
1101: REM *****
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1120: REM *****
1121: REM *****
1122: REM *****
1123: REM *****
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1125: REM *****
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1128: REM *****
1129: REM *****
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1399: REM *****
1400: REM *****

```

■ Demonstration 1

Smile, then get serious

Fire Ant £7.95

Magik, PO Box 487, 28-37 Wainford St, Linton WA4 4BT

I'm a fast reader, but I was only halfway through the command-to-learning instruction sheet when it moved on. There's another chance when the demo has finished but a little longer reading time and better teaching would be nice.

The program, hazards, is much better than its original inspiration. As the sole surviving soldier ant, you must rescue your Queen, held hostage on screen 8 by Scorpions. Success brings missions to further Scorpion colonies. At first glance, it might seem a Pacman variation.

The screens are visible most of the time, scattered round, scattering Scorpions, egg eggs, and randomly change to purple, outer-speed therapy.

Crusher instruction reveals yellow gains and force/force

blocking your way and further hazards become apparent during play. Lightning reflexes help, but you must collect the right objects in the right order, placing them in the right places to unblock tunnels and clear adjacent traps. Objects will kill you if they are taken out of order. And death is not a pretty sight, happening many times before you discover the correct method for each screen—swipe and swipe, then, swipe and swipe.

Scorpions sting many get you. The rewards pattern, multiple exits, low punning, and a fast joystick, is very addictive — doesn't look as if I reached level 8. Will safely adventure and arcade fans. More please! **8.0**

instructions	40%
playability	90%
graphics	60%
value for money	85%



Multisound Synthesizer £14.99

Rank, 272 Agyle Ave, Slough, Berks

This utility is designed to allow you to see the sound capabilities of the 64 without FORCING the range of control offered it enormous and the review can only hint at all the features available.

The synthesizer consists of three screen displays. You set up the characteristics of the note you want using a control screen. This allows you to adjust the attack, decay, sustain, release etc. The levels set for each parameter are indicated by a bar chart display.

Switching to the keyboard screen displays a three octave keyboard with the notes suitably identified, e.g. D is C# C, and D is C sharp. As the 64 has four rows of keys the keyboard becomes similar to a two keyboard organ. As you play the notes in use is indicated. You can move the entire keyboard up or down a few octaves as required. I

found this presentation made it very easy to play.

The third screen is for special effects, giving complete control over all the remaining sound features built into the 64. There are just too many to list here. You have control over all the filtering effects, oscillator and envelope, sweeping, ring modulation etc.

You can obviously create tunes, but you can also append tunes, store up to nine tunes in the 64's memory, superimpose tunes over one of eight built-in drum routines, or create your own. Lastly the tunes can be saved to tape or disk.

This program is great for two types of user — the one fingered organist and the instrumentist. It is an easy way of trying out different settings so you know what you want to code into your own programs. **8.0**

instructions	70%
ease of use	70%
display	80%
value for money	80%



Turtle Jump £6.99

Rank, 272 Agyle Ave, Slough, Berks

The screen setting is a map of islands in the Caribbean, with turtles swimming between them. Your objective is to get from one island to another and collect treasure points. However, it's not quite as simple as that.

You can jump short distances and travel on anything solid. This means you can travel from one island to another on the backs of the turtles, if you can keep your balance. The only trouble is that if a crocodile appears at the turtles' side, there are a few logs you could usefully jump onto, and there are also some small volcanic islands that appear and later sink beneath the surface. So it is possible, with difficulty, to travel the islands.

Food grows on the islands and is used to top up your energy level. There is an energy barometer displayed on the screen to guide you

when it's time for a forage.

You must recover the treasure by jumping in while the chest lid is open and getting out again before it closes. The longer you're in the more treasure you collect. Collected treasure must be taken back to your home base.

A nice game, where theme is different from the rest of the mill. I found it difficult to keep on the backs of the turtles and inadvertently tended to end up on one island far from the treasure but feeding myself fish. Needs joystick. **7.0**

instructions	70%
playability	80%
graphics	70%
value for money	70%



Cash Controller disc £14.95

Richard Shepherd Software, 23-25 Glaston St, Coppenham, Berks

A potentially useful package for those who like to keep track of their expenditures. The routines are nicely written and crash-proof.

The package starts by asking a man's name. First-time users return that asked from the Budget Menu you are allowed up to 10, e.g. can, besting phone etc. There is an option to change these if you have second thoughts. You can then allocate a budget to each. Finally you can transfer to the Bank Account Menu and set up an opening balance. To set an unnecessary repetition, you can even set up standing orders.

You would subsequently update via the Bank Account Menu. Entering transactions is very simple and prompts are clear. First you enter the date, then a short (up to 10) character description. Next you

enter the heading to be coded in and credit and the amount. That's all there is to it.

The computer does the appropriate calculations and printing as necessary. You can then call up a number of reports, to the screen or printer.

You can print out your budget headings, just for reference. More to the point you can print out details of your budgets and variances, the difference between what you allowed and what you spent. You can also print a statement listing all transactions between two specified dates.

I found the package foolproof by only noting it that there is no exit option which means leaving the computer off at the end. **8.0**

instructions	90%
ease of use	80%
display	70%
value for money	80%



New games and more serious software for the CBM 64 examined and rated by our experts.

Find out just how tasty worms can be — just type in Peter Godbehare's program for the unexpanded VIC-20

Peck, peck... but watch out for the spider



Your challenge is to eat the worms which keep appearing in your burrow. However, a spider is after your blood — and his touch is lethal. The controls are included in the game.

How it works

10-190 define characters
200-250 set up scoring screen and read for key press
260-330 get burrow on screen

340 sets up variables
350 puts man on screen
360-390 get random worms on screen
400-430 check for man hitting monster

450 prints score at the top of the screen
460-520 check for the directional keys to be hit

530-560 moves man left
560-590 moves man right
590-720 moves man down
730-820 moves man up
830-860 moves monster left to right
860-920 moves monster up or down
930-960 add 10 to score and make worms disappear
970-1010 got your routine

Variables

MA screen position of the top left corner of your man
LU top left character of your man
LD bottom left of your man
RU top right character of your man
RD bottom right of your man
SC score
MC screen position of the top left corner of the monster

REMs have been inserted in the lines above control characters to guide you as you type in Tweet Tweet. Do not enter the REMs. Remember also that it's quicker and ensuring all lines will fit if you abbreviate the BASIC keywords — there is a list in your manual.

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100 REM *****
110 REM *****
120 REM *****
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