

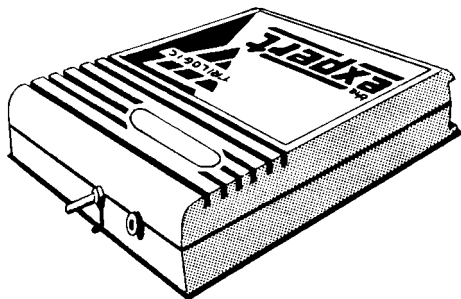


the **expert**

INSTRUCTIONS



PLEASE READ THIS
BOOKLET BEFORE
USING THE EXPERT CARTRIDGE



WARNING. COPYRIGHT SUBSISTS ON ALL TRILOGIC EXPERT HARDWARE & SOFTWARE.
NO UNAUTHORISED USE OF ANY WHOLE OR PART EITHER PRIVATELY OR
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THE EXPERT IS INTENDED FOR YOUR OWN PERSONAL ENJOYMENT - PLEASE USE IT'S
POWER RESPONSIBLY. (C) TRILOGIC 1987. E&OE

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INTRODUCTION.

Congratulations - you are now a member of an ever increasing band of EXPERT owners throughout the world. From TORONTO TO TIMBUCKTOO, REJKAVIK TO RIO, BAGDAD TO BRAZILIA, there are few Commodore 64 owners who haven't heard of the EXPERT - if you come across one - please tell us and we'll be sure to let him or her know what they are missing...

As you've obviously bought an EXPERT (or you wouldn't be reading this), we won't preach to the converted about how the EXPERT is the only user programmable, easily upgradable, unstoppable, most versatile cartridge in the world. In fact so many EXPERTers have told us that the EXPERT is the best thing they have ever bought for their 64 that we are glad Commodore designed the 64 to work with the EXPERT.....

Not surprisingly, because of the EXPERT's 'cult' status, we receive many programs & utilities from EXPERT programmers the world over - we are often impressed by your efforts & if you don't mind, we'd like to either give them away with EXPERT upgrades or pass them on to the EXPERT USER CLUB. Please keep sending them - and tell us if we can use them - we'll try to leave intact or incorporate any acknowledgment to their author(s) but this isn't always possible.

HAPPY EXPERTING.

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THE PRELIMINARY STEPS.STEP 1 - INSTALLING THE EXPERT.

- 1.1) SWITCH OFF THE COMPUTER
- 1.2) INSERT THE EXPERT INTO THE CARTRIDGE PORT.
- 1.3) SET THE EXPERT'S THREE POSITION SWITCH TO THE 'PRG' POSITION
- 1.4) TURN ON THE COMPUTER (HOLD DOWN THE CBM KEY ON THE 128)

The usual Commodore start-up message should appear showing 38911 bytes free - if not repeat steps 1 to 4 above.

STEP 2 - GETTING STARTED.

- 2.1) INSERT THE EXPERT MASTER DISK INTO THE DRIVE.
- 2.2) TYPE: LOAD"M*",8 AND THEN RUN.

This will display a menu of the MAIN DISK OPERATING SYSTEMS.

You can select either normal or turbo load - only use turbo load if your drive is in alignment or your EXPERT may not program properly.

You can load "MENU" whenever you are programming your EXPERT with one of these MAIN disk operating systems - but DON'T FORGET.....

THERE ARE OTHER OPERATING SYSTEMS FOR DISK TO TAPE ETC ON THE MASTER DISK.

NB Also, be sure to switch the EXPERT OFF (centre switch position) unless you are programming it otherwise when you select an option from the menu, the EXPERT will be activated as if you'd pressed RESTORE.

STEP 3 - PROGRAMMING THE CARTRIDGE FROM DISK.INTRODUCTION.

The programming procedure is the same for all the operating systems on the MASTER DISK. But first a word about the programs on the EXPERT MASTER DISK.

All programs on the disk called PART.... are EXPERT operating systems which reside in the cartridge. EXPERT EXPRESS is the only other program on the disk which uses the EXPERT although it is unlike the other operating systems. Programs which end in 'DISK' are for making back-ups on disk. Programs which end in 'TAPE' are for making back-ups on tape. In either case, the program to be backed up can be loaded from disk OR tape, or typed in in BASIC. Tape versions have fewer functional commands than disk versions. If a command is not available, ?? appears. BELOW IS A SUMMARY OF THE PROGRAMS 'ON THE MENU'

- A MENU - YOU'VE ALREADY LOADED THIS
- B EXPERT INTRO - SPEAKS FOR ITSELF.
- C PART1 TO DISK - PROGRAM PARALYSER & DISK BACK-UP GENERATOR.
- D PART2 TO DISK - SPRITE EXTRACTOR & SAVER (ON DISK)
- E PART3 TO DISK - SPRITE KILLER/ MONITOR PRINTOUT, JOYSTICK PORT SWAP.
- F PART4 TO DISK - HIRES SCREEN GRABBER & SAVER (ON DISK)
- G EXPERT EXPRESS - DISK TURBO & HIRES PRINTER DUMP
- H SPRITE DISK EDIT - THE SPRITE EDITOR PROGRAM - DISK VERSION
- I NO BLOCKS BOOT - FAST FORMATTER & EXPERT FILE TURBO LOADER
- J BOOT 1570/1 ONLY - FORMATTER & TURBO FOR 1570/1 DRIVES.
- K TO I ARE PROGRAMS FOR CONVERTING HIRES FILES TO VARIOUS FORMATS.
- U ADVANCED MONITOR - AN ADVANCED MONITOR FOR EXPERIENCED PROGRAMMERS.
- W PART1 TO TAPE - PROGRAM PARALYSER & BACK-UP ON TAPE.

- X PART2 TO TAPE - SPRITE EXTRACTOR & SAVER - ON TAPE
Y PART3 TO TAPE - SPRITE KILLER/MONITOR PRINTOUT, JOYSTICK PORT SWAP.

PROGRAMMING THE EXPERT

- 3.1) ENSURE THAT YOUR MASTER DISK IS STILL IN THE DRIVE.
 - 3.2) SELECT THE OPERATING SYSTEM OF YOUR CHOICE FROM THE MENU ACCORDING TO WHICH FEATURE YOU WISH TO USE AND WHETHER YOUR BACK-UP IS TO BE ON DISK OR TAPE.
 - 3.3) CHECK THAT THE EXPERT IS SWITCHED TO THE 'PRG' POSITION.
 - 3.4) SELECT TURBO OR NORMAL LOAD. (The led may glow during programming - this is okay).
 - 3.5) FOLLOW THE ON-SCREEN INSTRUCTIONS.
(Press SPACE to continue when you have read the instructions.)
- NB PHANTOM & other disk turbo users may find they that have to switch out their turbo system when using the menu to program the EXPERT. Alternatively, load the programs directly from the disk directory.

Your EXPERT is now programmed and whenever it is in command of your computer, you will see two lines of characters near the top of the screen (the register display) looking something like this:-

```
PC SR AC XR YR SP L1 QA NV-BDIZC
/ E5CD 22 00 00 0A F3 37 05 CCSCCCSC
```

- 3.6) NOW PRESS N TO INITIALISE THE COMPUTER & RESET TO BASIC

STEP 4 - PREPARING BACK-UP DISKS.

- 4.1) LOAD & RUN "MENU" AND FROM IT SELECT OPTION I.
 - 4.2) REPLACE THE EXPERT MASTER DISK WITH A BLANK DISK
 - 4.3) PRESS F5 TO FORMAT THE DISK.
- NB Use the standard slow Commodore Basic formatting (NEWing) command - OPEN15,8,15,"N:NAME,ID" if problems arise with the fast EXPERT formatter. (NAME is the disk header name & ID is a unique two digit identification number). (ID must be two digits).
- 4.4) PRESS F3 to SAVE THE "NO BLOCKS 800T" PROGRAM ON THE DISK. This program is needed to generate a menu of the files on your back-up disk and turbo-load them. It occupies no disk space and should normally be copied onto your disks first. You can only load files of upto 202 blocks without it.
 - 4.5) PRESS F1 FOR DIRECTORY
 - 4.6) PRESS F8 TO GO BACK TO BASIC.

PART 1 - THE PROGRAM PARALYSER & BACK-UP GENERATOR.
 =====

STEP 1 - PROGRAMMING THE EXPERT.

- 1.1) PLEASE FOLLOLW PRELIMINARY STEPS 3.1 to 3.5 AND SELECT MENU OPTION C FOR BACKUP ON DISK OR W FOR BACK-UP ON TAPE.
- NB If you select W to make a back-up on tape, some of the commands will not be functional. Eg \$, B, #, @, and S & L will save & load from tape instead of disk.
- 1.2) PRESS N TO INITIALISE THE COMPUTER.

STEP 2 - FREEZING A PROGRAM

- 2.1) SWITCH THE EXPERT OFF (centre switch position).
- 2.2) LOAD & RUN THE PROGRAM YOU WISH TO FREEZE FROM DISK OR TAPE.
- 2.3) SWITCH THE EXPERT ON AND TAP RESTORE.
IF THE LED IS GLOWING, PRESS THE (righthand) ESM BUTTON INSTEAD.
The program should briefly freeze to be replaced with the now familiar EXPERT two line 'register' display. See the CODE INTERROGATOR & MACHINE CODE MONITOR section for an explanation of the register display.

NB With some programs, as soon as you switch on the EXPERT the program will freeze and the EXPERT's monitor will be activated - this is okay.

STEP 3 - MAKING A BACK-UP.

- 3.1) Check that your back-up disk is in the drive - either the one you have just prepared in PRELIMINARY STEP 4 or another with enough space on it or a blank high quality rewind tape is in the datasette.

3.2) TYPE: Z"PROGRAM NAME"
(PROGRAM NAME is the name of the program your are transferring.)

NB DO NOT TOUCH THE KEYBOARD UNTIL THE CURSOR REAPPEARS.

First the EXPERT's compactor will compress the program - this can take upto 2 minutes and then the program will be saved.

THAT'S ALL THERE IS TO IT - To add more programs to the back-up disk or tape, simply repeat the procedure from STEP 1.2.

STEP 4 - TRYING OUT SOME OF THE OTHER COMMANDS.

So far we have used only the N and Z commands - N initialises and Z compacts & saves but the EXPERT has many others which you can experiment with either before or after saving a program.

R After freezing a game, you can restart it by pressing R
(it won't operate with all programs).

B Typing B will list any Basic in the game. (Not in tape version)

+ You can alter the EXPERT screen colours using the + command.
Type: +0A6 for example sets the border to 0, the background to A and the character colour to 6. (the values are in HEX so A = 10)

\$ To view the disk directory simply type: \$ (Not in tape version)

M The M command enables you to view the computers memory contents. We will look at this command in more detail since it is one you will use quite often and requires one or more PARAMETERS.

With this command you have to specify the starting address and (optionally), the finishing address of the listing. Toggling the SPACE bar stops & restarts the scrolling until you press STOP or the finish address is reached if you specified one. The CNTRL key slows down the scrolling whilst held down. Try these variations of the command:-
First type:-

N and tap RESTORE, then type:-

M 0431.

M 0431 0450

M 0431

The screen display comprises the memory address in the lefthand column; eight groups of two digits (bytes) which are the values (in HEX) in eight consecutive locations starting from the address in the lefthand column, and the ASCII representation of the eight bytes. Recognise the memory contents ? - you should do since 0431 is part of the screen memory.

The M command enables you to view every byte of the 64K ram and BASIC & KERNAL roms plus most of the 0000 block registers. To look into the roms, you must first type:-

X - this should now show XFF.

The X command is the memory map toggle switch. By default, X is 00 which is the 'all ram' configuration. Changing X to FF switches in the roms so that you can access them with the M command. Try this - type:-

X (if XFF appears type X again)

M AOC1. You should get:

```
:AOC1 00 00 00 00 00 00 00 00 '@@@@@@@
```

this is from the ram under the BASIC rom. Now type:-

X

M AOC1. Now you should get:-

```
:AOC1 47 4F 54 CF 52 55 CE 49 'GOTORUNI
```

this is from the Basic rom itself.

Now why not experiment with some of the other commands in the CODE INTERROGATOR & MACHINE CODE MONITOR section.

STEP 5 - LOADING BACK PROGRAMS FROM DISK.

THE EXPERT IS NOT REQUIRED FOR LOADING BACK.

- 5.1) INSERT YOUR DISK OF BACK-UP PROGRAMS AND TYPE:-
LOAD"B*",B (return)
- 5.2) USE THE CURSOR DOWN KEY TO SELECT THE PROGRAM YOU WISH TO
LOAD AND PRESS RETURN.
- 5.3) ONCE THE PROGRAM HAS LOADED (after about 30 seconds) PLEASE WAIT
A FEW SECONDS FOR IT TO UNCOMPACT AND RESTART.

STEP 6 - LOADING BACK PROGRAMS FROM TAPE.

- 6.1) - SIMPLY PRESS SHIFTED RUN/STOP. PROGRAMS SHOULD LOAD IN ABOUT HALF
THE TIME THE ORIGINAL TOOK.

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PART 2 - THE SPRITE EXTRACTOR.
=====INTRODUCTION.

This version of the operating system enables you to freeze a program, display the sprites (if any), view the sprite animation, and save them on disk for later editing or customising. You can then insert them into other games in place of the existing ones. Many of the other monitor commands are available too, so you can restart or save or 'look' through the memory as well as view the sprites.

But what are sprites ? Almost all games have moving objects - space ships, missiles etc and changing their shape and moving them about on the screen would be a slow, tedious process if it was not for a special feature of the Commodore video chip. This feature allows objects (ie sprites) which we want to move about to be predefined in the computers memory, and then moved as a whole by simply instructing the video chip where to move them. We can also have the video chip detect sprite to sprite collisions and sprite to character collisions for us.

Sprite animation is an illusion produced by defining several sprites each slightly changed. For example, to give the effect of rotating a space ship, many sprites would be defined in the memory, each based on a different 'view' of the space ship as it would appear if rotated in steps. Displaying them in turn therefore gives the illusion of rotation - the faster the rate of displaying the sprites, the faster the rotation.

There can be upto 8 sprites on the screen at any one time, but there could actually be dozens of sprites defined in the memory ready to be displayed as the game progresses. There are 4 blocks of 16K where sprites can be found - all are accessible with this utility, although not all blocks may actually be used in any one game.

STEP 1 - PROGRAMMING THE EXPERT FOR SPRITE EXTRACTION.

- 1.1) PLEASE FOLLOW PRELIMINARY STEPS 3.1 TO 3.5
SELECTING OPTION D FROM THE MENU FOR BACK-UP ON DISK OR X FOR
BACK-UP ON TAPE
- 1.2) PRESS N TO INITIALISE THE COMPUTER.

STEP 2 - VIEWING SPRITES.

- 2.1) SWITCH OFF THE EXPERT & LOAD IN THE GAME OF YOUR CHOICE.
- 2.2) FREEZE THE GAME WHEN THE SPRITES YOU WISH TO SAVE ARE ON THE
SCREEN.
- 2.3) TYPE: Y TO DISPLAY THE SPRITES.

You will see up to 8 sprites on the screen; the leftmost one is sprite No.1 from the video bank which was in use when you stopped the game. The first 4 (left to right) are in two colour HIRES mode and the remaining 4 are in multicolour mode. Sprites can be in one or more video banks, of which there are four, so F1 together with the B command enables you to view all the sprites in a game. NB Not all sprite positions are used so some sprites will appear to be made up of random characters.

STEP 3 - SAVING A SPRITE

- 3.1) INSERT A DISK WITH ENOUGH SPACE ON IT INTO THE DRIVE OR A BLANK TAPE INTO THE DATASETTE.
- 3.2) USE F1 OR F7 TO MOVE THE SPRITE INTO POSITION 1 (ie the leftmost position on the screen).
- 3.3) TYPE: KS"SPRITE NAME"
DO NOT TOUCH THE KEYBOARD UNTIL THE CURSOR REAPPEARS.

STEP 4 - LOADING IN A SPRITE.

- 4.1) PROGRAM THE EXPERT AS IN STEP 1 ABOVE.
- 4.2) LOAD & RUN THE GAME WHOSE SPRITES YOU WISH TO REPLACE.
- 4.3) FREEZE THE GAME WHEN THE SPRITE TO BE REPLACED APPEARS.
- 4.4) TYPE: Y TO DISPLAY THE SPRITE.
- 4.5) USE F1/F7 TO LOCATE THE SPRITE IN POSITION 1.
- 4.6) INSERT YOUR SPRITE DISK OR TAPE
- 4.7) TYPE: KL"SPRITENAME" (you can omit the sprite name when loading from tape - JUST TYPE: L). This will load in the sprite and insert it into position one. You can use sprites from another game, or ones that you have edited or designed from scratch using the SPRITE EDITOR.
- 4.8) NOW RESTART OR SAVE THE GAME (R OR Z COMMANDS).

SPECIAL SPRITE EXTRACTOR COMMANDS.

- Y Displays sprites.
- F1 Scans forward through the sprite memory - this has the effect of showing the stages in the animation of sprites.
- F2 AS F1 but scans in reverse - back through the memory.
- B Change video bank. (press B return, on the 5th press you will be back to the first bank again)
- KL"SPRITE NAME" Loads a sprite from disk & inserts it in position 1.
- KO Turns sprites off & restores STOP key function - DISK VERSION ONLY
- KS"SPRITE NAME" Saves sprite No.1 (the leftmost one)
- +nm Changes the sprite colours.
- n is 0 to 7 to change the first colour of sprites 1 to 8.
 - n is 8 to change the second colour of the last 4 sprites.
 - n is 9 to change the third colour of the last 4 sprites.
 - m defines the colour - in the range 0 to F.
- NB The last four sprites are in multicolour mode & have three colour options.
- NB The sprites will be restored to their original colour when you restart the game.
- Z"PROGRAMNAME" - Compacts & saves the game to disk.

OTHER COMMANDS.

Only the following monitor commands are available: R,M,U,?,N,P,O,W.

NB If you use the M command, the STOP key will NOT halt the scrolling so tap RESTORE to do this. However, with operating system D the KO command will restore the STOP key function. KO is NOT implemented in version X.

THE SPRITE EDITOR.

STEP 1 - LOADING THE SPRITE EDITOR. - EXPERT NOT REQUIRED.

- 1.1) SAVE THE SPRITES YOU WISH TO EDIT ON DISK or TAPE USING THE SPRITE EXTRACTOR DESCRIBED IN PART 2.
- 1.2) TYPE: N TO EXIT FROM THE EXPERT.
- 1.3) TYPE: LOAD"SPRITE*",8 OR select H from the menu.
- 1.4) TYPE: RUN

The screen will show a box in which the sprite to be edited is loaded. You can of course design a sprite from scratch if you wish.

SPECIAL EDITING COMMANDS.

<u>COMMAND</u>	<u>FUNCTION</u>
F1	followed by the sprite name will load in the sprite.
F3	followed by the sprite name will save the sprite on disk.
F7	lists the directory.
CURSOR KEYS	move the editing cursor within the box.
M	toggles between HIRES & MULTICOLOUR mode.
I	inverse video.
R	scroll right (wraps around)
L	scroll left (wraps around)
U	scroll up
D	scroll down
X	horizontal mirror image.
Y	vertical mirror image.
SHIFTED 1	changes sprite colour 1 - hold down the keys to show them
SHIFTED 2	changes sprite colour 2 " " "
SHIFTED 3	changes sprite colour 3 " " "
SHIFTED 4	changes the border/text colour.
SHIFTED 5	changes the background colour.

The current colours are shown by 'indicators' below the bottom right corner of the box - an arrow shows which is in use at any instant.

1	selects pixel colour 1
2	selects pixel colour 2
3	selects pixel colour 3 (only operates in multicolour mode)
*	inserts a pixel at current cursor position.

STEP 2 - EDITING A SPRITE

Load in a sprite already saved - it will be shown in the box. Now move the editing cursor (a pixel sized 'window'). Press * when you want to insert a new pixel, or space if you want to delete one. The pixel will appear in the one of the current colours; the arrow pointing at one of three 'indicators' below the bottom right corner of the box shows which colour is in use. SHIFTED 1, 2 or 3 will change each of the colours (hold down the shift & number key until your choice of colour is shown). Pressing 1,2 or 3 will move the arrow and select the actual pixel colour.

NB These colours are for editing ONLY - when you insert a sprite into a game, the colours will be reset to those used in the game - this is unavoidable since the sprite colours are defined as the game progresses.

NB In multicolour mode the resolution is half that of HIRES mode.

When you are satisfied with the alterations, press F3, enter the sprite name and the sprite will be saved.

PART 3 - THE SPRITE COLLISION KILLER, MONITOR PRINTER & JOYSTICK SWAP.

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INTRODUCTION

This version of the operating system includes a few special features in place of some of the usual monitor commands.

There is no K or B commands in the disk version (option E) and no A or K command in the tape version (option Y). The J, E, I & Y commands have different functions.

STEP 1 - PROGRAMMING THE EXPERT.

- 1.1) PLEASE FOLLOW PRELIMINARY STEPS 3.1 TO 3.5 AND SELECT OPTION E FOR MAKING A BACK-UP ON DISK OR OPTION Y FOR MAKING A BACK-UP ON TAPE.
- 1.2) PRESS N TO INITIALISE THE COMPUTER.

STEP 2 - THE SPRITE COLLISION KILLER.

- 2.1) SWITCH OFF THE EXPERT & LOAD & RUN A GAME OF YOUR CHOICE.
- 2.2) SWITCH THE EXPERT ON & FREEZE THE GAME.
- 2.3) TYPE: EB TO FIND & DISABLE THE SPRITE TO SPRITE COLLISIONS
- 2.4) TYPE: E TO FIND & DISABLE THE SPRITE TO BACKGROUND COLLISIONS.
The border will flash whilst a search for the sprite collision routines is made. If any are found - and please note, many games do not use them - the addresses are listed and the collision detection disabled.
- 2.5) NOW SAVE OR RESTART THE GAME.

STEP 3 - THE MONITOR PRINTER.

- To obtain a hardcopy from any of the monitor commands.
- 3.1) TYPE: Y
This will turn on the printer (CBM Serial type only) and then type the command eg D 1000 2000 will produce a printout of the disassembly of memory from 1000 to 2000
 - 3.2) TYPE Y again to turn off the printer.

STEP 4 - JOYSTICK PORT SWAPPER.

- To change the default joystick port of a game.
- 4.1) LOAD & FREEZE A GAME.
 - 4.2) TYPE: J
Now a search will be made for the routines which read the joystick port used, these will then be changed so that the other port will be read when the game is restarted.
 - 4.3) NOW SAVE OR RESTART THE GAME.
 - 4.4) TYPE: J AGAIN TO SWAP BACK TO THE ORIGINAL PORT.
- NB This feature will not work on all games.

THE CHEAT MACHINE, CODE INTERROGATOR & MACHINE CODE MONITOR.

=====

INTRODUCTION.

Some cheats are enclosed with your EXPERT and many more are published in the EXPERT USER CLUB magazine - "EXPERTISE" - free to members. However, options E & Y (the 'PART 3' operating systems) include an I command which can give infinite lives with some games.

STEP 1 - INFINITE LIVES.

- 1.1) PROGRAM THE EXPERT WITH OPTION E OR Y OPERATING SYSTEMS.
- 1.2) LOAD & RUN THE GAME OF YOUR CHOICE
- 1.3) FREEZE THE GAME WHEN YOU HAVE TWO LIVES LEFT.
- 1.4) TYPE: I
- 1.5) RESTART THE GAME TO CHECK OUT WHETHER THE COMMAND HAS WORKED.
- 1.6) SAVE THE GAME IF YOU WISH.

STEP 2 - HOW TO ENTER OTHER CHEATS & POKES.

- 2.1) PROGRAM THE EXPERT WITH OPTION C, E, W OR Y OPERATING SYSTEMS.
- 2.2) LOAD, RUN & FREEZE A GAME.
- 2.3) ENTER THE CHEAT AS SHOWN ON THE CHEAT SHEET.

The principle is usually to 'list' a line of the games machine code with the D command and then alter the code by overtyping with the cheat data. In most cases EA is inserted in place of whatever was there - this is interpreted as a NOP instruction. NOP stands for No Operation and has no effect - it is used here as a safe way of deleting the original instruction or data.

The F command can also be used to fill one or more locations with EA - this has the same effect as using D as above. Similarly, M can be used - just overtype the specified locations with EA and press return.

Some games require changes to be made before the game is saved or the back-up will not run - these changes are detailed on the cheat sheet and there are also some on the UTILITY disk. (Available for £5.95)

PART 4 - THE HIRES GRABBER & PICTURE SAVER. - ONLY FOR DISK USERS.INTRODUCTION.

This utility enables you to save a hires picture on disk. You can then edit/customise it using Koala Pad or similar utilities. Please note, it is NOT possible to put a hires picture back into a program. Reserve a disk only for pictures - preferably don't use a disk which has program files on it.

STEP 1 - PROGRAMMING THE EXPERT.

- 1.1) PLEASE FOLLOW PRELIMINARY STEPS 3.1 TO 3.5, SELECTING OPTION F FROM THE MENU.
- 1.2) PRESS N TO INITIALISE THE COMPUTER.

STEP 2 - CAPTURING A HIRES SCREEN.

- 2.1) SWITCH OFF THE EXPERT & LOAD IN THE GAME FROM DISK OR TAPE.
- 2.2) WHEN THE HIRES SCREEN APPEARS QUICKLY SWITCH ON THE EXPERT & TAP RESTORE TO FREEZE THE PICTURE.

Often the loading screen of a game is in hires mode - the subsequent screens are most likely not.

STEP 3 - SAVING A HIRES SCREEN.

- 3.1) INSERT A BLANK FORMATTED DISK INTO THE DRIVE
- 3.2) TYPE: B"PICTURENAME"

STEP 4 - CONVERTING THE EXPERT PICTURE FILE INTO OTHER FORMATS.

- 4.1) SIMPLY SELECT THE CONVERTER YOU WANT FROM THE MENU AND FOLLOW THE ON-SCREEN INSTRUCTIONS.

The purpose of these converters is to enable you to edit/customise a hires picture with one of the graphics utilities whose formats are listed.

STEP 5 - DISPLAYING A HIRES PICTURE FROM BASIC.

- 5.1) First you must convert the picture file into KOALA format using the appropriate converter. For example, if it was an EXPERT file you would use option L.
- 5.2) Next select option M and follow the on-screen instructions. The file produced by this utility can be loaded and run just like any BASIC program - so you could incorporate a hires picture into your own BASIC programs.

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EXPERT EXPRESS & HIRES PICTURE PRINTER

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INTRODUCTION.

EXPERT EXPRESS is a special EXPERT resident program which can be used as a disk turbo loader and also to print out ANYTHING on the screen

STEP 1 - PROGRAMMING THE EXPERT.

- 1.1) FOLLOW PRELIMINARY STEPS 3.1 TO 3.5, SELECTING OPTION G FROM THE MENU.
- 1.2) AFTER YOU HAVE PRESSED RESET, THE COMPUTER WILL RESET BACK TO BASIC - THERE IS NO EXPERT MONITOR WITH THIS OPERATING SYSTEM.

STEP 2 - ACTIVATING THE TURBO DISK LOADER.

- 2.1) TAP RESTORE TO ACTIVATE THE EXPERT EXPRESS.
- 2.2) PRESS F5 TO ACTIVATE THE QUICKLOADER & THEN F1 TO EXIT TO BASIC
- 2.3) TYPE: LOAD"\$ FOR THE DIRECTORY.
- 2.4) TYPE: LOAD"FILENAME TO LOAD A FILE.

STEP 3 - ACTIVATING THE PICTURE PRINTER

NB ANY CURRENT SCREEN - HIRES OR LOW RES IS PRINTED OUT

- 3.1) TAP RESTORE WHEN YOU WANT TO PRINT OUT THE SCREEN.
- 3.2) PRESS F3 TO MAKE A HARDCOPY VIA A CBM SERIAL PRINTER.
- 3.3) PRESS F1 TO EXIT TO BASIC.

OTHER PROGRAMS ON THE EXPERT DISK.DISK TO TAPE.

This program does not use the EXPERT, and enables an EXPERT disk file to be transferred to tape.

STEP 1 - TRANSFER PROCEDURE.

- 1.1) TYPE: LOAD"D*",8 - DO NOT TYPE RUN YET.
- 1.2) INSERT THE DISK WITH THE FILE YOU WISH TO TRANSFER.
- 1.3) NOW TYPE RUN.
- 1.4) USE THE CURSOR KEY TO SELECT THE FILE AND PRESS SPACE.
- 1.5) THE FILE WILL NOW LOAD IN AND THEN YOU WILL BE ASKED TO PRESS PLAY & RECORD ON TAPE.

NB If the computer goes back to BASIC whilst reloading - it means BAD data has been saved - YOU MUST USE HIGH QUALITY, PREFERABLY NEW, DATA TAPES.

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INTRODUCTION

The Monitor software, which is part of the EXPERT CARTRIDGE TAPE TO DISK SYSTEM is a very powerful tool with several unique features. The Monitor is completely invisible to the user and can be used over the whole of the 64K ram. It can be used to access both Basic & Kernal roms and the \$D000 input output block registers and ram under the roms and under this block.

Typical uses are: interrogating/inspecting a program, (M and D commands), altering a program (M command), list any Basic parts of a program (B command), write a machine code program (A command), convert numbers from decimal to hex and vice versa (U & ? commands), search for addresses, data or text (H command).

Whenever you tap the RESTORE key (or press the ESM button where necessary), the screen will clear and the EXPERT's machine code monitor will be activated. It is from within this monitor that all the functions of the EXPERT are controlled. The screen will display the registers & will look typically like this:-

```
PC SR AC XR YR SP L1 QA NV-BDIZC
/ 2677 C3 22 44 56 F8 37 05 CCSCCSCC
```

The top line lists the various important registers and below are the actual values held in the registers at the instant the game was stopped.

```
PC = PROGRAM COUNTER          SR = STATUS REGISTER
AC = ACCUMULATOR             XR = X REGISTER
YR = Y REGISTER               SP = STACK POINTER
L1 = LOCATION 0001
QA = THIS IS THE CURRENT Q VALUE.
```

NV-BDIZC THIS SHOWS THE STATUS OF THE FLAGS. S = SET, C = CLEARED

You can change the contents of all the registers by directly overtyping the current value with a new one. You can change any of the flags by altering the SR value.

THE MONITOR COMMANDS.

PLEASE NOTE, All versions of the operating system do not have all the commands listed - some may be omitted or the functions changed for more specialised uses.

Type the command followed one or more parameters. A ? will appear if you omit an obligatory parameter. Each command is followed by an example. Hexadecimal notation is used.

COMMAND	PARAMETER(S)	FUNCTION
A	1000 LDX \$00	ASSEMBLES

Starts assembly at \$1000. in this example the X register is loaded with the value in location \$00. You will then be prompted for the next instruction address. Press RETURN to terminate the assembly.

A TIP: When using the A command to write a short machine code program use the \$C000 area where possible. This will avoid affecting any Basic programs in memory. Also, to execute the program, type W (return) to exit the monitor and then do a SYS to the start of the program. Eg A C000 LDA #\$60 (return) and so on assembles at C000. Then SYS 49152 (C000 in decimal) to execute it. Don't use the J or G commands unless you know what you are doing.

B

BASIC LIST

This produces a listing of the BASIC part of any program similar to typing LIST in Basic. All anti-listing techniques are bypassed.

- C 1000 2000 3000 COMPARES
 Compares the block from \$1000 to \$2000 with the block at \$3000 to \$4000. The address of any location which differs is displayed.
- D 1000. DISASSEMBLES
 Disassembles one line of code starting from location \$1000.
 If you omit the final . the disassembly will continue until you press the STOP key, or pause it with the SPACE BAR. This command has been changed in that you can now directly alter the disassembled code by using the cursor keys to locate the characters to be overwritten. Instructions, addresses and data can be altered as necessary. Press return to enter the changes.
- D 1000 2000 DISASSEMBLES
 As above but disassembles between the two addresses specified.
- E 2000 20FF 45
 This command EXCLUSIVELY ORs the memory between the start and end addresses given with the byte specified in this case, 45.
- F 1000 2000 XY FILLS
 Fills memory from \$1000 to \$2000 with a value, where XY can be any number from \$00 to \$FF.
- G 1000 GOES TO (JUMPS)
 Starts executing a program from location \$1000 using the current register values.
- H 1000 2000 A9 00 FD HUNTS
 Hunts through the memory between \$1000 & \$2000 for the sequence of bytes - in this case A9 00 FD and displays the addresses if any, where they were found.
- H 1000 2000 'HELLO' HUNTS
 Hunts between \$1000 & \$2000 for text string "HELLO" (in ASCII) and displays the addresses if found.
- H 1000 2000 "TEST" HUNTS
 Hunts between \$1000 & \$2000 for the screen value of the text string "TEST" (the ASCII sequence found with the previous H command would be 54 45 53 54 whereas the screen sequence given by this command would be 14 05 13 14
- I 4000 5087 C0 INCREMENTS
 Increments the area from 4000 to 5087 by C0.
- J 5000 JUMP (subroutine)
 Executes a JSR to \$5000 with an RTS afterwards.
- K 4000 4FFF 0277 SEARCHES
 Searches between the specified addresses for any references to the location \$0277 including branches.
- K 4000 4FFF 0277 0350 SEARCHES
 Searches between the specified addresses for any references to the memory block between \$0277 and \$0350.
- K 4000 4FFF 3000 3FFF 7000 SEARCHES
 Searches between the specified addresses for any references to the memory block between \$3000 & \$3FFF and change them to point to the area from \$7000 onwards.
- L "PROGRAM NAME" LOADS
 Loads a program from device 8 (disk) to the address from where it was saved.
- L "PROGRAM NAME" 2000 LOADS (relocated - disk only)
 Loads a program from device 8 to memory commencing from location \$2000.

- M 1000. MODIFIES
 Displays the contents of one line of memory (8 consecutive locations) starting at address \$1000, with the ASCII form on the right of the screen. You can alter the contents of any location with this command. Use the cursor keys to locate the byte you wish to overtype. Enter the new value and press return. The new value will appear in place of the old one unless you are trying to "poke" into a rom location, when the old value will reappear. If you omit the final . the listing will continue until you press the STOP key or pause it with the SPACE BAR.
- M 1000 2000 MODIFIES
 As above but displays all memory between the specified addresses.
- N NEW
 Fills the 64k ram with the current fill byte & Resets back to Basic.
- N XY NEW
 Fills the 64k ram with the byte XY (XY lies within the range 00 to FF)
- O Redisplays the current registers.
- P SPECIAL NEW
 Fills the memory with occasional random bytes and RESETS back to Basic.
- P XY SPECIAL NEW
 Fills the memory with XY (XY can range from 00 to FF) plus occasional random bytes followed by a RESET back to Basic.
- Q
 This command will try to find a block of memory suitable for use as explained in section 5 paragraph 2. This command is executed automatically when you enter the EXPERT by tapping RESTORE.
- Q 02
 This sets the Q value to 02 ie the block used starts at 0200 to approximately 02E1.
- R RESTARTS
 Restarts the program you halted by tapping the restore key. Can also be used after compacting and saving the program.
- S "PROGRAM NAME" 1000 2000 3000 SAVES (disk only)
 Saves memory from \$1000 to \$1FFF to device 8 (disk) so that it loads back at \$3000.
- S "PROGRAM NAME" 1000 2000 SAVES
 Saves memory from \$1000 to \$1FFF inclusive
- T 1000 2000 3000 TRANSFERS
 Transfers the contents of the memory between \$1000 & \$2000 to \$3000 & \$4000. This is an improved T command. It will transfer between blocks which overlap. eg T 2000 4000 3000
- U UNHEX
 Converts a number from HEX to decimal. (opposite of ? command)
- V "PROGRAM NAME" VERIFIES (disk only)
 Verifies a program on disk with that in the ram and lists the addresses where there is a difference.
- V "PROGRAM NAME" 4000 VERIFIES (disk only)
 Verifies a program on disk with that in the ram at 4000 and lists the addresses where there is a difference.
- W WARM START
 Causes a warm start similar to pressing RUN/STOP RESTORE.
 NB. Doesn't always work with a game if the vectors have been altered.

DOs & DON'Ts AND HELP & HINTS.

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1.1) A NOTE FOR ENHANCER DISK DRIVE USERS.

You may not be able to use the "No Blocks Boot" program with this drive. On the EXPERT MASTER disk is a program called "BOOT" which has the same function but there are two points to remember:-

- 1) This version of "BOOT" MUST be the first file on the disk.
- 2) It does occupy a small amount of disk space.

To copy "BOOT" onto your back-up disk, insert the EXPERT MASTER disk & type:-

```
LOAD"BOOT",8 (return) Now insert your back-up disk & type:-
SAVE"BOOT",8 (return)
```

1.2) DISK DRIVE MISALIGNMENT.

If the computer hangs-up during the programming procedure, it is possible that your disk-drive is slightly out of alignment. If the red disk-drive error light flashes during programming, then this is almost certainly the case. To get around this, make a back-up of 'the EXPERT MASTER disk using (preferably), a slow disk copier program such as the one supplied by Commodore with the drive.

1.3) FAULTY DISKS & FORMATTING.

Fast formatting utilities, including the one incorporated into the No Blocks Boot program, are not very reliable. Faulty disks - eg 'bad' sectors & format failure give similar symptoms: the disk may keep on spinning after saving a program, the drive error light may stay on or flash, and listing the directory will show "0 blocks" saved and *PRG next to the program you were trying to save. If there is insufficient space on the disk you may get these symptoms too. Try using the BASIC command - OPEN15,8,15,"N:DISKNAME,ID"

1.4) WRONG Q VALUE.

The Q command is very important - the wrong Q value will most likely cause your back-up version to hang-up.

Because programs transferred to disk or tape with the EXPERT do not need the cartridge plugged in for loading back, a small amount of memory is needed for the program to be uncompactd and reorganised just prior to restarting. However, with most programs these days, there is very little spare memory left and what available space there is varies in amount and location from one game to another.

When you press RESTORE, immediately, the EXPERT operating system attempts to find a free block of about 227 bytes where the uncompacting routines are stored. These routines are now incorporated into the program and saved with it. The area found is shown by the two digits - the Q value - shown as QA in the register display when you press RESTORE. The Q value shows where the free block is located and by adding two zeros to the Q value you can find the actual block used. Eg, Q = 04; block used = 0400 to 04E1. If the Q value is preceded by a minus sign then part of the screen memory has been used since the system could not find any other area. The side effect of this is that part of the screen will be corrupted on reloading but if you stop the game near the start - on a menu screen say, then when the game gets going, the new screen will overwrite the corrupt one.

It is possible that with future games, this "automatic" Q value finder could be defeated. So to find a free area yourself, use the M command to 'look' through the memory starting from 0400. Then when you have found what could be an unused area of 227 bytes (minimum) commencing at the beginning of a block set the Q value manually using the Q command. NB A block starts when the last two digits of the first location end in 00 & 227 bytes is E1 in Hex so the area must extend to xxE1. For example, Typing M 0400 (return) and using the space bar to pause the scrolling, could show that a possible free area starts from 0460 to 05D6. The nearest block begins at 0500 so from 0500 to 05E1 would be the area to use so set the Q value to 05 by typing: Q 05 (return). Don't omit the space.

1.5) PROGRAM WILL NOT RUN.

Some programs will not run if a disk drive is connected although they will load normally. If this happens, switch off the drive until you are ready to save the program. Eg Green Beret.

1.6) EXPERT ACTIVATED UNEXPECTEDLY.

Some programs generate NMIs which activate the cartridge unexpectedly. By leaving the switch in the off position until just prior to pressing the RESTORE key to stop the program, this problem can be overcome in most cases. Eg Spiky Harold & Iridis Alpha.

1.7) PROGRAM WILL NOT LOAD.

Some programs will not load, apparently detecting that the EXPERT is connected even though it may be turned off. They are in fact simply detecting that the memory has been altered from what it would have been had the computer just been powered up.

Type P (return) instead of N return if this happens. This will reset the machine in a slightly different way. Typing: P XY (return) will fill the memory with XY (where XY is any two digit number in HEX from 00 to FF) but with other random bytes inserted here and there. Only use P as a last resort since the compactor works more effectively with N. Also try W (return) - this will perform a 'warm' start, and finally, as a last resort, after going back to Basic with N (return), switch off the EXPERT and press the RESET button. (Use this method to load Dragon's Lair (disk version), and some Cyberload programs.)

1.8) OTHER CAUSES OF PROBLEMS.

The RESTORE key is seldom used, and in some cases, does not work. If tapping it with the EXPERT programmed & switched on, does not cause the monitor prompt to appear, then a fault with this key & associated circuitry is probable. Try this test: hold down the RUN/STOP key and tap RESTORE with the EXPERT switched off or unplugged. The screen should clear and 'READY' be displayed on the top line. If not, then your computer requires attention. If this test is passed, then a fault within the EXPERT is indicated.

Faulty EXPERT software, cartridge or computer can make it impossible to program the EXPERT. If a blackscreen remains on power up even with the EXPERT switched off, then suspect the EXPERT or your power unit. (Commodore power units are notoriously unreliable and the slight extra current taken by a cartridge can make them fail unpredictably).

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