FINAL POWER

After reviewing **Evesham**'s Cartroidal offerings last month I've been inundated by a whole host of other such products for evaluation. Two equally impressive looking ones both purporting to perform near identical tasks are the **Final Cartridge** and **The Power Cartridge**. The Final Cartridge has been around for quite a while but as it's being constantly updated the version we were given (version 7) bears little resemblance to its first incarnation. Power Cartridge is a new thing packaged in a very natty as—never—seen—before red boxlet (it matches my briefcase). For some extremely strange reason both of the plug-ons were originated in Holland, maybe the dullness of the Netherlandic software market pushes the little clog wearers into designing new hardware for their 64s. Well it beats stuffing yourself with Edam.

Both cartridges provide an alternative operating system for the 64 and add many much needed facilities that should really and truly have been included in the first place. Still what does a porky review person do when told that a cartridge is a 16K operating system? He totally disbelieves them that's what he does. With screwdriver in hand I managed to prise the tops off both cartridges and found that what the literature said was true. Both boxes hold sixteen K eproms and a whole bunch of switching circuitry (TTL's and such like) for chugging out the old operating system and electronically plugging in the new.

The main features provided by both carts are very similar. First, for the ardent fans of BASIC, there's the toolkit giving access to a large number of extra editing commands plus the ability to handle Hex, a task notoriously nasty in BASIC. Of the two The Power Cartridge just wins out as all the extensions provided by FC are provided plus a few other equally useful functions including the very handy DOKE (a 2 byte poke).

Next in the line of handy add-ons added on are the various turbo tools. For the tape user both extensions provide very easily used tape turbos that troll the data in and out of the cassette port at about ten times the speed of the normal CBM silly blue screen loader. Both functioned perfectly reasonably and are quite an obvious boon to any cassette bound person.

The disk turbos are also handy since, as any 1541 owner will now know, Commodore's disk drive is pathetically slow. With either of these handy hunks of plastic installed certain disk operations are speeded up by five times. The Final Cartridge turbos both loading and saving while Power Cartridge only gives the loading process a helping hand.

The first Gary Liddon test of any disk turbo is to see if it works with my assembler, *Machine Lighting*. It's more an exercise in hope than a true test of the turbo since it would be so nice to have a disk turbo when heavily accessing the disk as is often the case when I've got the assembler out. To date all turbo cartridges have managed to corrupt some obscure zero page location that *Machine Lighting* just happens to use. The result is a cross Liddon and a thoroughly unrecoverable situation. FC did, to my complete and utter unsurprise, foul up while The Power Cartridge worked perfectly well cheering up the Liddon visage a great deal. Still Final Cartridge works well with a majority of programs at a respectable 5 times the normal speed — so you really shouldn't be that put off because it won't work with an obscure assembler. Also, as a handy add-on, both carts make disk access a darn sight easier with the addition of the DLOAD and DSAVE commands that take away all the hassle of having to type all that 8,1 rubbish.

Monitors

Included on both offerings are neat monitors that easily allow manipulation of memory throughout the 64. All the usual, and very useful, block move, memory edit, one line assemble and other such commands are included for the user's delectation. There's not really a lot to choose between the two except for some rather silly reason (probably just a slip of memory) The Power Cartridge denies the user any ability to look underneath BASIC or Kernel. The Final Cartridge, however, allows all of the ROMS to be turned off and you can even knock out I/O (£D000,£DFFF) and have a PEEK at what's lurking under there.

Printer Bits

Well thanks to the frugalness of ZZAP! financial director, Franco Frey, we don't actually have a printer for our 64 and as a result I was unable to test out any of the comprehensive printer functions supplied by either cartridge. Still the inlays haven't lied yet and so this is what they claim to do. The most notable additions are the screen dump facilities that can be accessed at any time, even when with a game up and running. So now it's possible to dump out game screens. If the screen is character based, however, you won't see the redefined characters. If it's a high res screen then it dumps using shades to depict the sixteen different colours. Power Cartridge supports a wider range of printers, so it's more likely to be useful than Final Cartridge.

Freezing

Both boxes have some manner of reset on the back. Hitting them takes you to a menu and both allow the state of the machine to be saved out as it is. It's a very similar effect to using a freeze frame. With both add-ons, to limit their pirating powers, you actually have to have the cartridges in place when loading back what's been saved out. It's quite sensible really since games saved out shouldn't really be loaded by anyone else except the owner of the original. From these reset menus it's also possible to get into a monitor. Very handy if you know the start address of a game and want to bung in some pokes.

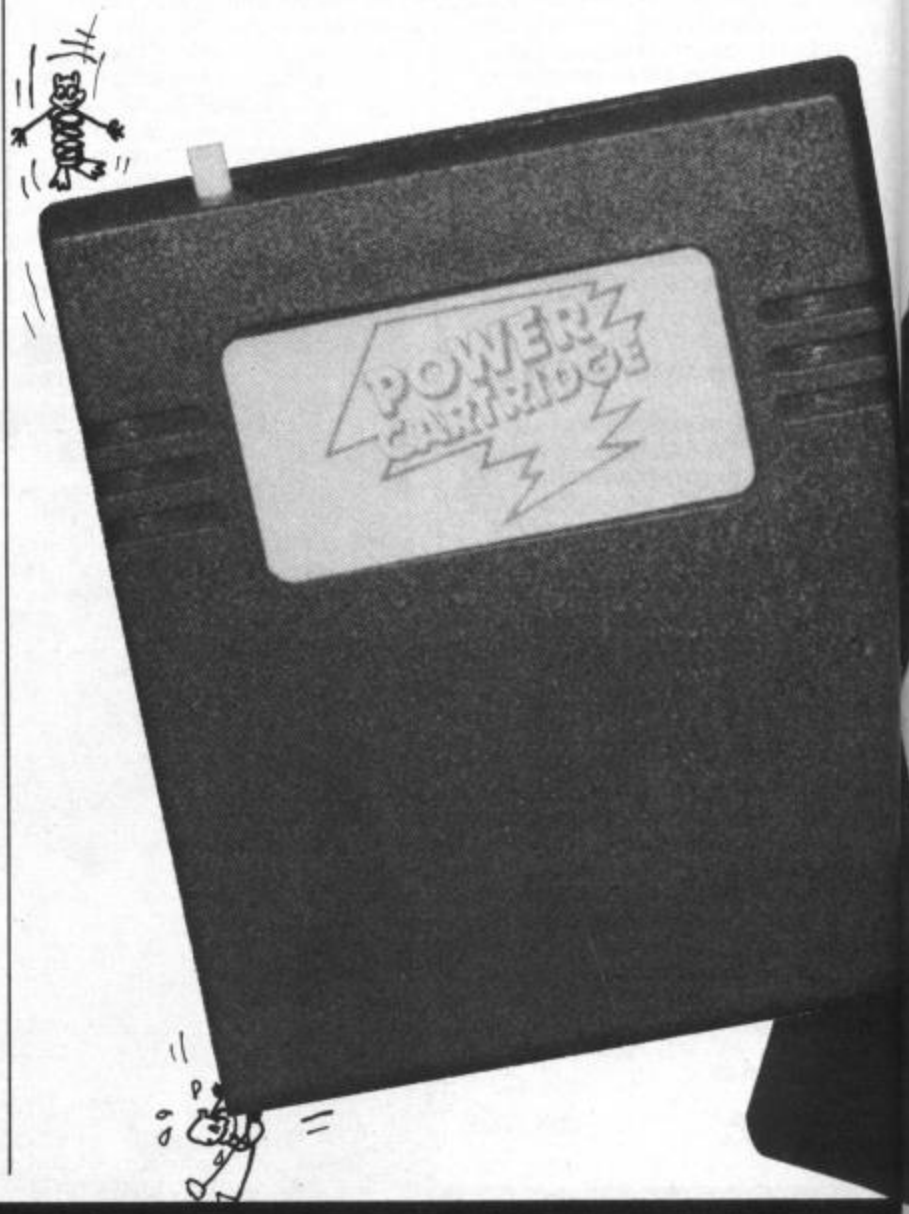
Extras

As a plus the Final Cartridge also comes complete with a game killer variant though to be honest I couldn't get it to work. An 'extra' also included on Final Cartridge is an increased finickiness over loading tape games. With the FC in it was loath to load quite a few of our tapes. Still there's an on/off switch at the back which should cure the problem. If you wish it's also possible to quit the Power Cartridge with the fairly obvious QUIT command. With either cartridge installed the function keys are reprogrammed to handy functions.

Summary

Both cartridges function fairly well though a few quirks came up with the Final Cartridge, a nasty one was from the freeze menu. There's an option to jump to the reset menu but it didn't work and just spilled garbled sprites onto the screen. A couple of times Power Cartridge refused to acknowledge key presses in the reset menu. This only happened twice and both times it was possible to get out of the situation by pressing reset again. There's very little to choose between the two but out of them I like the Power Cartridge best, mainly because it's slightly easier to use than FC. In the documentation stakes the PC also comes out just on top as it does on the packaging side of things. I know it may seem a bit petty to go on about the packaging but after skinning out forty five quid (which both add-ons cost) it's nice to feel you've bought something. The PC packaging is very neat and professional while the Final Cartridge came in a clear plastic bag with a computer print out instruction leaflet.

Anyway I can recommend either of the two to any 64 user/programmer, especially those with disk drives, and though the price is a mite steep you'll find yourself wondering how you ever managed without the help they provide.



Monitoring the bugs

Laser Genius is not only an assembler/editor, it also includes a full monitor and debugger. The best thing about this is its ability to work with all of your program's labels. If you suddenly need to look at the contents of a variable then **MLIST varname** will do the job.

Included in this section are handy single step routines for debugging a faulty listing.

All in all I regard the assembler as excellent, it provides the best environment I've seen yet on a 64 for the creation of code. Even if the *Laser Genius* package only consisted of the assembler/editor it would still be top of my utilities list, but it doesn't end there, yet before us lies the Analyser.

Interpreting the code

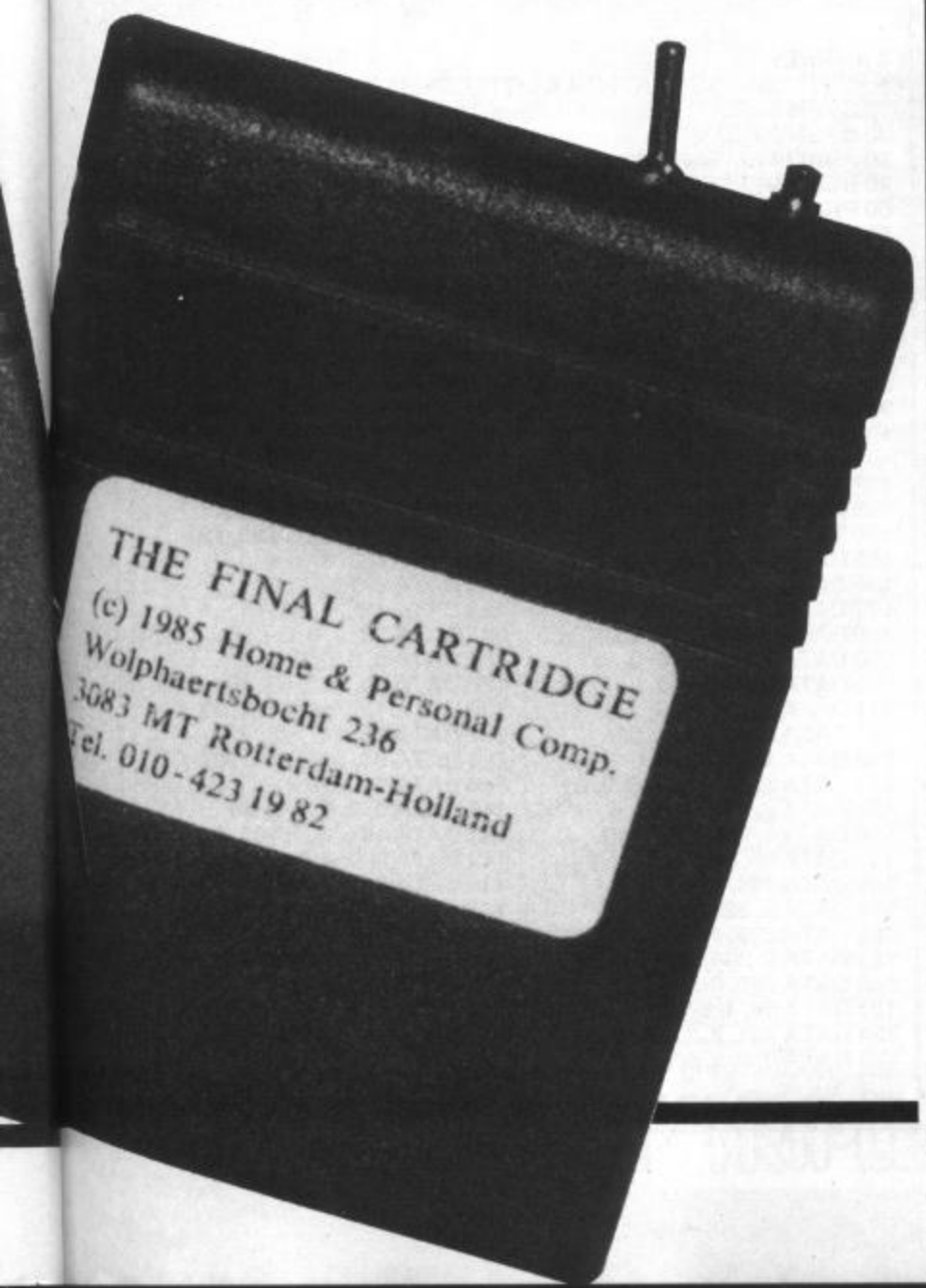
At its most basic and fundamental level the Analyser is a machine code monitor for aiding the faltering first few steps of a new program. If this is all the analyser offered then a truly unremarkable thing it would be, however this is not the case. What is very neat and innovative about the Analyser is that it contains a 6502 interpreter. Instead of running the code as a 6502 program it's possible to have the Analyser run it in a similar manner as the Basic interpreter does BASIC. The advantage is that with your program under such control it makes checking for errors very easy indeed. Understandably enough the code runs at a much slower speed while being interpreted but the depreciation is worthwhile for the control you now have over even the most unruly of programs.

A usual problem with bugged progs is that they corrupt certain areas of memory they shouldn't. Hunting down the misprogrammed object code causing such errors is usually time consuming and awkward. Using the Analyser's facilities it is possible to have your code interpreted in real time until certain conditions are met. Telling the Analyser which conditions have to be met to stop execution is done via a FORTH like language. Using this flexible system it's possible to halt execution when a certain memory location is read or written to, when any register is set to a certain value, even when any of the 6502 status registers are set.

The disadvantage of such a flexible system is that it does take a while to learn the new language, however the results are worthwhile since, once mastered, Oasis' *6502 Analyser* becomes an invaluable tool.

The reckoning

Overall I wouldn't hesitate in recommending *Laser Genius* to any potential or perennial programmers looking for a decent assembler. Within its field *Laser Genius* is most definitely tops and offers excellent value for money when compared to its rather inadequate contemporaries. Even if at the moment you are using another make of assembler and you're relatively happy with it, I should still take a look at Ocean's latest as I'm sure you'll be surprised by the amount of work it will save you.



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