

The Celeron will have a tough time when **the next budget chips are released**, says Gordon Laing.

The cheap chip challenge



It's hard not to notice that virtually every penny of Intel's advertising budget is spent promoting the Pentium – can you imagine how the poor neglected Celeron feels? On the upside, the Celeron can sleep happy in the knowledge that it

provides a great price over performance ratio to both entry-level buyers and hardware enthusiasts who know how to squeeze every last drop out of it. After all, the latest FC-PGA Celerons running at 566MHz or above are essentially nothing less than Pentium IIIs with half their on-die Level 2 cache and a 66MHz front-side bus (FSB). But get ready for bouts of insomnia, Celeron, as AMD's Duron CPU looks set to give you sleepless nights.

AMD recently had Intel grinding its teeth by releasing ever-faster Athlons. However, like the first PIIIs, the Athlon employed off-die Level 2 cache, running as slow as one-third of the CPU clock. So while Intel and AMD announced 1GHz CPUs within two days of each other,

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the PIII's full-speed Level 2 cache ran at 1,000MHz, compared to 333MHz on the Athlon – and it makes a big difference to performance. AMD has now re-addressed the balance by matching the PIII's 256KB full-speed Level 2 cache on its new Thunderbird Athlons.

At first glance, the Duron appears to be to the Thunderbird what the Celeron is to the Pentium III – a budget version with cut-down specifications. So saying, it's worth looking at what's hiding under the hood.

Like the Celeron, AMD sells the Duron at slower clock speeds than its premium counterpart. Like the Celeron, the Duron has fast, on-die Level 2 cache, but what's this? Where the Celeron has half of the PIII's Level 2 cache, the Duron has only one-quarter of the Thunderbird – that's 128KB versus 64KB and one-nil to Intel. Look a little closer and those Celerons faster than 566MHz also talk to their Level 2 cache using the PIII's 256bit interface, compared to a mere 64bit interface on the Duron (and Thunderbird).

On the upside, the Duron has 128KB of Level-1 cache, compared to 32KB (16 + 16) on the Celeron which, when added to the Level 2 cache, lets AMD quote a total 'on-chip' cache of 192KB, compared to 160KB on the Celeron. Then there's the issue of the FSB. As a differentiator to its PIII line, Intel still designs Celerons to use a 66MHz FSB and normally drives their memory at the same speed. In comparison, the Duron employs the same Double Data Rate (DDR) technology of the Athlon, thereby chatting to its chipset at 200MHz, albeit only driving memory at 100 or 133MHz, depending on the chipset. It's still a big difference, though.

As we've discovered, the chipset and memory type in a system have a massive impact on performance. Until forthcoming solutions from AMD, SiS, and ALI arrive, the Duron is only officially supported by VIA's KT133 chipset, which is essentially the same as the earlier KX133, except that it supports AMD's new Socket A form factor. With the launch of the Duron and Thunderbird Athlons, AMD is dumping its Slot A CPU interface in favour of the 462-pin Socket A.

A small number of Slot A Thunderbirds have been produced for testing in old AMD 750 chipset systems, but as far as end users are concerned, Sockets are the future. Will we see 'Sloket A' cards, allowing Durons and Thunderbirds to be used in existing Slot A motherboards? Sadly, it looks unlikely, at least for the old KX133 chipset, which does not support the new CPUs.

So it looks like we'll have to invest in a new Socket A motherboard, although at least these will take both Durons and Thunderbirds. If you're interested in AMD's new CPUs, though, I'd wait until October when VIA's KT266 chipset arrives, supporting new 266MHz DDR SDRAM. A version for Intel CPUs is due a month earlier.

It's certainly an interesting time for budget CPUs. VIA's Cyrix III 'Joshua' chip is a cheap alternative for Socket 370 systems and Intel won't let the Celeron go without a fight. Then again, the Duron seems attractive: at the end of June we checked UK chip prices and found the 650MHz Duron at £89, compared to £90 for the 566MHz Celeron (inclusive of VAT). So long as the high power consumption of the Duron coupled with volume manufacturing isn't a problem, then AMD could again rule the value PC market that Intel fought so hard to capture. Is that the sound of grinding silicon teeth I hear?

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With our GSM system fragmenting daily, Barry Fox wonders who will step in to **pick up the pieces?**

Variations on a theme



Americans, with three different and incompatible digital cellphone systems, say they envy Europe's simplicity of a single GSM standard.

But there are already three variants of GSM: the original (used by Cellnet and Vodafone)

works at 900MHz, while Orange and One2One are at 1,800MHz and the GSM services in the US are at 1,900MHz. So dual- or triple-band phones are needed for international roaming. Although it should be possible to take the SIM card from any GSM phone and use it in another, service operators interlock cards, phones and networks. Mobile Internet access, which is creating the need for higher data rates, is further fragmenting the standard.

Wireless Application Protocol (WAP) phones have been available for a year and have been absurdly overhyped. Market analyst Ovum has already pronounced a 'backlash' of consumer disappointment. Setting up a

In Japan, NTT's DoCoMo I-mode service is a roaring success with **SEVEN MILLION USERS, blowing WAP away**

WAP phone can involve 100 key strokes. So service operators send the settings as an SMS message. But helplines have to be able to help users store and load the settings message. Often they can't.

Telecoms watchdog Oftel has now said it has no powers to stop cellphone companies ripping off consumers with national or premium-rate helplines that cannot help or give wrong advice. Exactly what useful purpose does Oftel serve? Answers on a postcard.

Most networks and services either offer free WAP phones, or give them to anyone who pushes for one. For example, Breeze promises a voice-activated WAP service later this year, with free phones and no subscription.

The third-generation mobile systems will deliver much higher data speeds, but at prices which reflect the £5b each of the five operators paid for their licences and the similar cost of building a new infrastructure. Meanwhile, existing operators are readying stopgap systems, that introduce more incompatibility.

France Telecom just paid £25b for Orange and promises a 'wire-free future'. But the takeover creates a split in standards that will stop New Orange subscribers roaming with multimedia across the English Channel.

In September 1998, Orange promised subscribers a video-cellphone which uses proprietary technology developed by the University of Strathclyde. Although Orange could initially show only mock-up dummies, finished phones are now working. They rely on a 28.8Kbits/sec link obtained by ganging together two 9.6Kbits/sec cellphone data channels and modifying the error correction to increase each to 14.4Kbits/sec.

Orange will use this High Speed Circuit Switched Data (HSCSD) system, delivering 28.8Kbits/sec to laptop PCs and handheld devices with plug-in PC Cards.

Although the promised service launch is now six months late, Hans Snook, chief executive of New Orange, insists it will happen soon. 'The network is all ready to carry HSCSD but we have been hamstrung by hardware supplier Nokia,' he grumped.

Cellnet, Vodafone and One2One have all rejected HSCSD and are readying the incompatible General Packet Radio System (GPRS). This exploits the fact that multimedia devices handle data in bursts, so data from each of several devices can be chopped into labelled packets and the data capacity of several channels pooled. Devices can then transmit and receive bursts at over 100Kbits/sec.

'I have yet to see any GPRS devices,' said Snook. Funny, because Snook's new owner, France Telecom, runs the Itineris network, which started a GPRS service in May and says the whole of France will be covered by the end of the year.

In Japan, NTT's DoCoMo I-mode service is a roaring success with seven million users, blowing WAP away. I-mode can handle conventional HTML, whereas WAP sites have to rewrite their pages. Like GPRS, DoCoMo I-mode is a packet system. Users can be charged for data moved, not time online. A Dutch telecoms provider is working with NTT on a European I-mode service.

So far, the Japanese have been squeezed out of the Western cellphone market by giants Motorola, Nokia and Ericsson. Japan is waiting in the wings to pounce, just as it did with fax machines, VCRs and laptop PCs. The duffness of WAP and the HSCSD-v-GPRS pantomime gives it a window of opportunity.

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Cutting out the publishing middleman is attractive, but Brian Clegg doesn't think it'll work.

To ebook or not to ebook



For trendy businesses the Internet is an unparalleled opportunity – at least until the bubble bursts – but for some, it's a source of fear. A horrible word hangs over book publishers like the blade in Poe's *The Pit and The Pendulum* –

disintermediation (I said it was horrible). All publishers, whether heavyweight book companies, such as HarperCollins or magazine publishers like VNU, are middlemen. They take writers' words, package them, distribute them and extract revenue from the buying public. This is a very necessary service. While desktop publishing and computer typesetting mean it's easy to produce your own book, all you achieve is a mouldering pile of print in your garage. With a million other titles to choose from, chances are WH Smith and friends will turn up their noses at your offering, so it will never reach the public.

Enter the ebook. Just write your matchless prose, set it up on an ebook site and wait for the money to come rolling in. The packaging is trivial, the Internet handles worldwide distribution and the web server collects the cash. Writer to reader with no publisher involved. Disintermediation. Of course, this didn't seem a threat until big-name authors started to take part, but Stephen King set the cat among the pigeons by publishing a novella this way. From the publisher's viewpoint, the rot has set in.

Now publishers (not surprisingly) argue that they add value. They point out that most writers have the design sense of a halibut; it's the publisher that adds the zappy cover that makes you want to buy the book. It's the publisher that filters out thousands of unreadable manuscripts. And it's the publisher that delivers the physical book into our hands. In reality, though, many of these arguments are dubious. After all, it's usually an independent designer that develops the cover, and no doubt direct edesign services will spring up alongside ebook vendors.

As for the filtering role, it's certainly true that a published book will usually be readable and relevant – but there are plenty of good books that never make it into print. For those who only buy books by an author they know, there would be no real difference. For the

more adventurous reader, an ebook emporium should be able to give tasters of a much wider range of writer before buying, opening up choice.

While it's easy to shoot down most of the publishers' claims, the one about producing the physical book needs attention. There is something special about a book. It's quite different from a document produced at work, or even a newspaper or magazine. A book might not be ideal for every use – CD-ROM encyclopaedias are demonstrably better – but when you want to sit down and read, a book is compact, robust and kinaesthetically satisfying, as psychologists would say. So what's the alternative? Ebooks on PC monitors are non-starters. A screen is neither clear nor convenient enough for comfortable reading. A palmtop gives you portability, but you lose even more detail – the page is too small and low resolution compared with print – and the device is too delicate to be thrown into a beach bag. Printing isn't a solution either. No-one wants to print off a whole book, and unbound A4 sheets simply aren't practical. The difficulty of reading ebooks makes them currently little more than novelties.

One day, though, the technical problems will be overcome. Last year IBM announced flexible transistors that could be sprayed onto sheets of plastic

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for the money to come rolling in

to produce a screen that could be rolled up and stuck in the pocket – a precursor to electronic paper. Recognising that technology will eventually succeed, some publishers are trying to avoid being squeezed out by getting involved themselves. The UK's largest independent business publisher Kogan Page, for instance, is trying out 200 of its titles in ebook form to see what will happen. These will be available alongside printed versions in online bookshops like Barnes and Noble, as well as from ebook sites. But don't expect many ebestsellers. Ebooks will grow in popularity and may eventually kill publishers, but any panic is premature. Traditional books will put up more of a fight than vinyl records ever did.

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We all want **privacy and security**, says David Fearon, but unfortunately they don't go hand in hand.

A private matter?



I have to confess that on the all-important issue of my electronic privacy, I don't fit the usual mould of Internet geeks to whom it's a subject to get into a screaming rage over. It's just not something I've ever had cause to get worked up about.

I've never produced anything important or revolutionary enough to worry about the security of my emails in the face of possible corporate espionage. And if I thought that any of Her Majesty's finest were taking the trouble to monitor my electronic communiqués, well, I'd probably be quite flattered. At least, that's how I used to think.

Recently, I've had cause to do some research into cryptography. Now governments, even big ones such as the US, are terrified of modern cryptography. It's generally accepted that a decent strong encryption algorithm, such as the IDEA algorithm used in Phil Zimmerman's PGP, will be secure against even the world's most powerful computers for decades to come. Naturally, the fact that a single individual with a PC can hide any digital information from the planet's largest governments makes them a bit nervous.

So, while I'm doing my research and sending emails back and forth, I get sucked into the paranoid mindset of the cryptographer. Have my emails been flagged by some supercomputer buried in Reading because they contain sensitive encryption-related keywords? If the Government's Regulation of Investigatory Powers Bill is passed, that type of scenario may become a reality.

Under the Bill, the UK Government could gain all sorts of powers, not only over encryption schemes, but also the routine interception of plain emails. Hop over to www.cyber-rights.org for more information. Suddenly, and for about five minutes, I become the world's most fanatical electronic privacy campaigner. Then I wander into the living room and switch on the news and my views do a rapid about-turn: the top story is the conviction of nail bomber David Copeland.

It was reported after Copeland's conviction on several counts of murder that he learned how to make bombs via the Internet. A couple of years back, when the mass media jumped at any chance to portray the Internet as a sea of corruption for the sake of a juicy story, I'd have

taken that assertion with a pinch of salt. But now, with so many people having web access, I'm fully prepared to believe that Copeland learned how to build his awful devices solely via the anonymity of the web and it's possible, although I've no proof, that if he hadn't had web access, he would have stood more chance of being noticed by the police before he killed two men and an expectant mother last year.

I walked down Old Compton Street the day before the bomb in the Admiral Duncan pub went off, so the Copeland case is something I've been particularly aware of, but it's something that concerns us all. It's true that we need to be incredibly vigilant where incursions into electronic civil rights are concerned, but at the same time we need to curb knee-jerk reactions of opposition to any government-led surveillance initiatives.

I disagree with electronic rights campaigners that claim a criminal who's going to commit a crime will do it whether the Internet is there or not. As far as I'm concerned it's an undeniable fact that the Internet makes it easier to commit certain types of crime. Whether it's the irresistible ease of firing up Napster and illegally downloading the tune that's been floating around your head, the porn sites that rip off people stupid enough to give them their credit card numbers,

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or the darker and thankfully rarer information-gathering forays of the likes of Copeland, that near-perfect anonymity and ease of information retrieval make the web a one-stop shop for the nascent baddie.

The world always needs opposing points of view, and the Internet is no exception. Hopefully, with the governments frantically pulling in one direction and the electronic privacy lobby heaving away in the other, neither side will win the tug of war and we'll end up with a sensible compromise that will allow me to send my emails without fear of a commando raid on my house, but will also go some way to ensuring that deranged monsters, such as Copeland, get stopped before they destroy any more people's lives.

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