Missing the big time

From a small Cambridge firm with a friendly bank manager, to a prized BBC contract.. to a rescue by Olivetti. Where did Acorn go wrong? Founder Hermann Hauser tells Wendy M Grossman a story of missed opportunities.

Hermann Hauser believes that if he had had just a little more foresight ten years ago, the world would now talk about Acorn compatible rather than IBM compatible computers.

`Looking back, we were so far ahead of anybody else in the industry, including Apple and IBM,' he says. What Acorn missed was the importance of strategic alliances and standards, which is why, when Hauser started his current project, EO's Personal Communicator (reviewed in *PCW*, February 1993) he went to every major company he could think of.

Born in Vienna, Hauser grew up in the Tyrol. He used to come to Cambridge in the summer, starting when he was 16, to learn English. After his first degree at Vienna University he settled in Cambridge to do a PhD, followed by a year's postdoctoral work at the Cavendish Lab.

Hauser is one of the founders of EO and its predecessor, the Active Book Company. He was involved in founding IXI, maker of graphical interfaces for Unix among others, in addition to setting up Olivetti's research division. He is probably best known, however, for founding Acorn with Chris Curry in 1978. The company started life as a microcomputer consultancy and its first product, a computer kit, was launched in 1979. The timing was fortuitous.

`It was the same time as Apple in the US, and the market was ripe for an Apple type computer,' he says.

The kit had two selling points that Hauser has tried to keep consistent throughout his career: it was technically ahead of the competition and it was easy to use. Easy to use is a relative term (the computer was programmed in hexadecimal code with its hex keyboard) but there were people for whom the kit posed no problems.

`I'll never forget this exhibition we went to,' Hauser says. 'We showed this thing assembled and it was all working. It was beautiful; it had an LED and a seven segment display. It was all dots when it was in the reset state so you knew everything was working, which wasn't very often, but remember in those days people really preferred those computers not to work because it gave them a chance to fix them.'

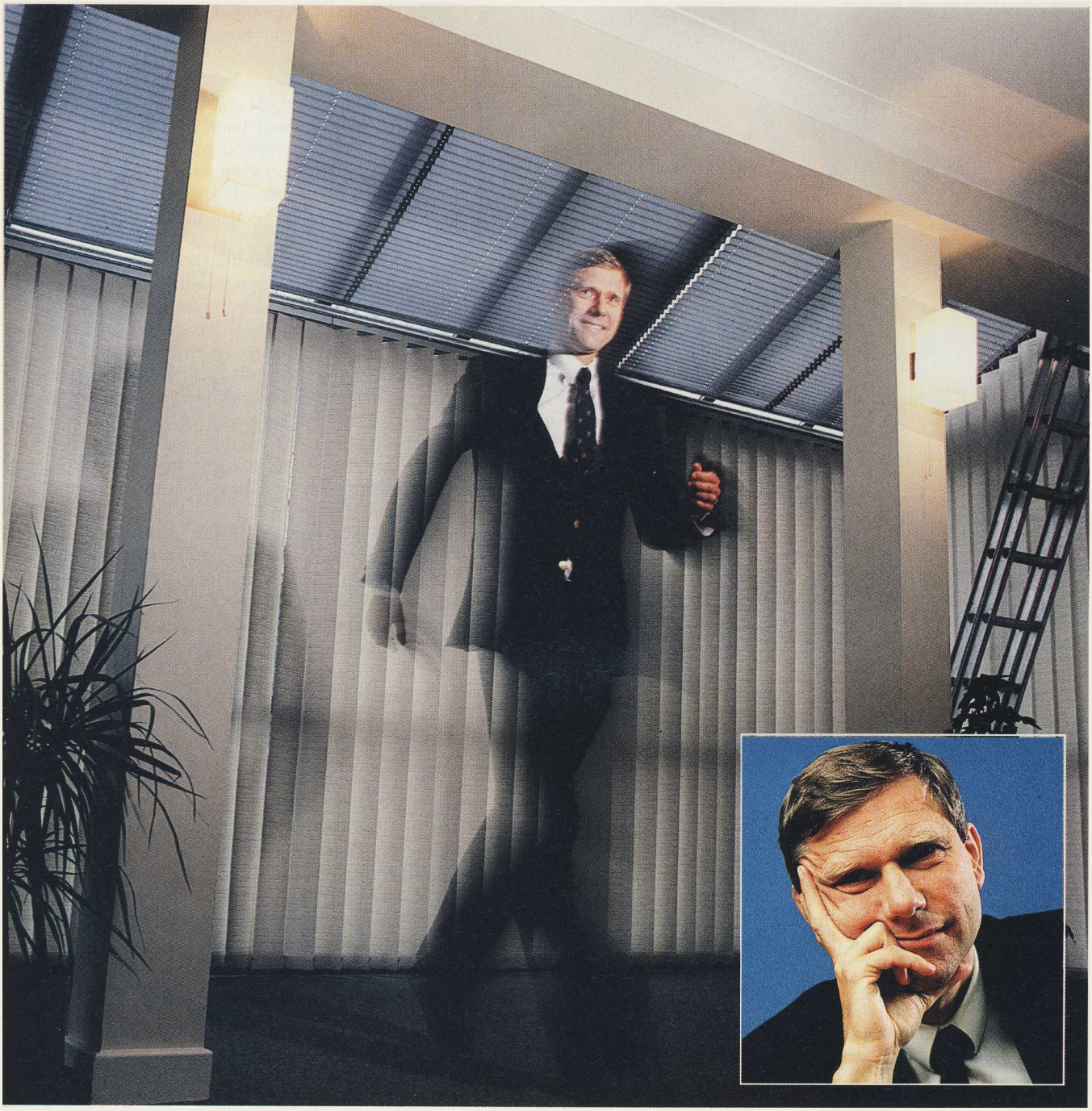
Onto the stand to look at the Acorn came a nineyear-old boy with his younger brother in tow. 'And he said: " Look, Johnny, this is the new Acorn machine." I thought, precocious whizzkid, knows the Acorn. And he said: " Look, Johnny, this is a hexadecimal keyboard." And I thought, this kid's really picked up some jargon here. Then he said: "Look, Johnny, it says Mem here; this is probably for memory." So I thought, this will probably throw him. So he pressed Memory, and said: "Ha! You've got four hexadecimal digits here: this must be the address." He went on like this through the whole thing, and it was quite difficult because you had to enter the data in hex. I was just completely flabbergasted, because he knew more about this than I did.'

But difficult as that kit was for adults, Hauser says it was still easier than the others available. It was also expandable, with video cards or more memory. Part of its success, he says, was due to Roger Wilson who was then an undergraduate student at Cambridge. Wilson showed up one day and said he thought he could build a computer kit that was a lot better than those on the market at the time.

`So we said: "Sure, let's do one. Produce a prototype, and if it's good we'll sell it." And he said "OK" and went away. A week later he came back with a prototype that he had handwired and said: "I've also written some systems software for it, but now it needs to be blown into this PROM."'

Blowing meant programming binary systems

PHOTOGRAPHY BY JOHN MILLAR



software by selectively applying high voltage to blow the connections between specific wires on a chip full of transistors. 'I said: "This is all very well, but how are you going to debug it?" It was very difficult to debug things, and we didn't have a debugger because we were poor in those days. And he said: "Oh, it doesn't need debugging. I've already written it to be correct."'

This, Hauser knew, was impossible: no software works correctly the first time. But in the end, they blew the PROM using the code Wilson had supplied — and it worked first time.

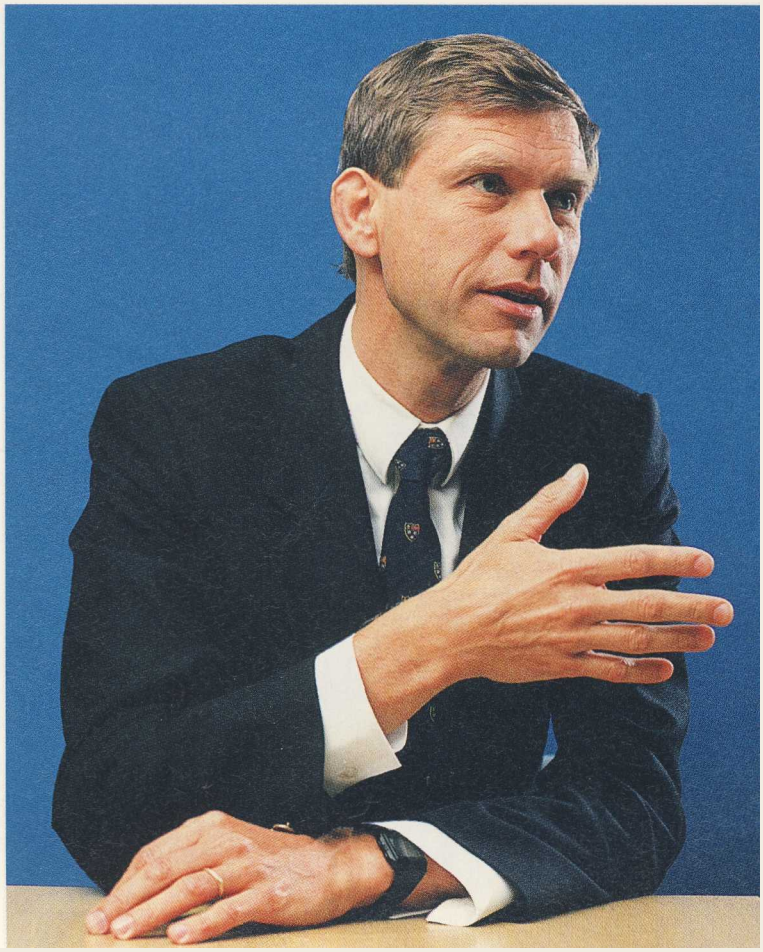
'In fact, there were two minor flaws that were then corrected, but the system worked well enough for you to use it to find them. I think there was one seven segment display that was wrong, and five minutes later we blew the second version, and that was the version we shipped to customers.'

Hauser continues: 'This guy turned out to be a genius. Together with Steve Ferber he invented the Acorn RISC Machine.' Wilson joined Acorn as soon as he finished his degree.

Acorn's next product, the Atom, was given two more unusual features. One was a video interface that let you hook it up to a TV set; the other, which Hauser says was completely unheard of in those days, was a case. This was Chris Curry's marketing flair working.

`He produced the most beautiful case that you've ever seen, and we put this ad in Practical Electronics, a full-page ad — we scraped all the money together. In those days you could get all these things mail order. We put that ad out, and we just couldn't shovel the cheques to the bank. It just flooded us with this enormous demand.'

That set the pace for the next few years. 'From



then onward, until we went public in 1984, the one problem with Acorn was producing enough. We just cranked up production at a phenomenal rate and in one year we grew from £8 million to £40 million. That was a factor of five in one year. In Silicon Valley this was not unusual but in Britain there was no experience of a company growing that fast.'

To put that growth in context, you have to understand that Acorn started life with £200 to its name. Hauser explains: 'We never put more than £200 into that company personally; at one stage, every pound we put in was worth £1 million. It was great while it lasted.'

It wasn't long, though, before the fledgling company began to need money. (Even in 1978 you couldn't get very far running a business with £200.) So Hauser went to his local bank and consulted the manager.

`I remember the discussion as if it were yesterday. I asked him if he could lend us some money —if we could have an overdraft. He said: "Oh, good to see these young people start companies. Which college did you go to?" and I said: "Kings, just across the road." "Oh, jolly good," he said. "How much do you need?" And I said: "£5000." And he said: "Very good. Go away, and come back and tell me how you're getting on."

`I came back a month later and said: "It's all going very well, but we now need £10,000." "Jolly good, go away, have £10,000." This went on for a couple of years, and we impressed him by being in the black at least once during the month. It was a typical overdraft arrangement, and he was very comfortable with that because he saw it — and we had gone to Kings, which he could see from his office.

`Second chapter. At some stage we got the BBC contract, and I went back and said: "Look, the £10,000 isn't really enough." He said: "Well, it's going jolly well; I know because I see your accounts. How much do you need now?" And I said: "Well, a million, actually." And this completely freaked him out.'

The relationship ended there. One million was beyond the amount he was authorised to lend, and the local office couldn't handle it because the situation didn't obey any of the rules it was familiar with. But Acorn did get its financing.

`At that time, there was a clever young man at Barclays Bank called Matthew Bullock, who wrote a number of reports on the Cambridge phenomenon and became a banking guru. He'd been following us for some time, and Barclays understood that these companies in Silicon Valley can sometimes go spectacularly well.'

There was another quirk in Acorn's situation that Barclays understood but the local Cambridge bank did not. 'We'd asked for a£1 million overdraft, but at one point we had £2 million sitting in an escrow account of people who had already paid for the product. So the only risk was that we might not be able to produce the product: the money was already there, and the demand was clearly there too. So Barclays jumped in, got the account and gave us the £1 million, and things went extremely well for Acorn for a while.'

Getting the BBC contract is another story Hauser likes to tell. The BBC had decided about two years earlier that it ought to educate the nation by doing a series of ten programmes on computer literacy. The producers wanted hands-on demonstrations with a computer that people could buy, and they drew up a specification. After two years, when the BBC had failed to get a working prototype from the company it had hoped would build the machine, it opened up the bidding to six different companies. One of the conditions was that the chosen company could produce the 12,000 computers the BBC anticipated the show would sell.

`They came to see us on a Monday,' says Hauser, `and they told us the specification of this computer, and it was just typical BBC. It was way over the top in every way: the amount of processing power, the integrated graphics, the connectivity it had to have for the rest of the world, the printers... Basically, they wanted to make a programme about the computer industry, so this thing had to do everything that you'd ever thought of.'

By a stroke of luck, Acorn had a design that was just a little bit better than what the BBC had asked for. We thought it couldn't be built, that it was over the top. So on the Monday I got on the phone and said to Steve Ferber: " What's the chance ofbuilding a prototype by Friday?" He said: "Completely out of the question: there's simply no way this can be done." So I rang Roger Wilson and said: " Roger, I've just had a word with Stephen, and he thinks it's really hard, but if we really tried we could have a prototype by Friday." And Roger said: "Absolutely no way, but if Stephen says it, I'm in."'

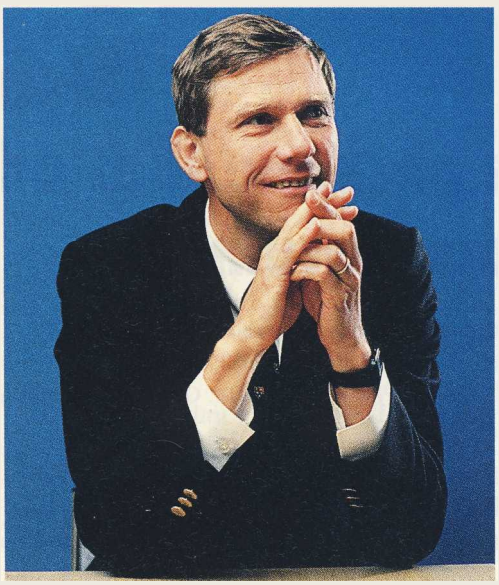
To help them, Acorn hired Ramesh Bannerji from the Computer Lab, who Hauser describes as `the fastest gun in the west'. Bannerji's skill was in wire wrapping as fast as people can call out the connections to be made, without ever making a mistake. 'So, this guy just went completely bananas for a whole day.'

The hard part, as always, was the debugging, which they worked on for three days and three nights. Hauser's major contribution during this time was making lots of cups of tea to try and keep everyone going.

`They had to be there at 10am on the Friday morning, and we'd worked all through the night. It was 8am, and this thing didn't work. I thought it was time for me to change my role now, show them what a hotshot designer I really was underneath this tea lady façade. There was this development system on the prototype that we had, and we had linked it with a clock wire. I said: This clock wire introduces a skew on the clock here, and you just cut this umbilical cord: it will make this thing work all on its own." They've never for-

given me for that, because that was actually it, and this thing worked well enough to be demonstrated to the BBC. '

When the BBC arrived and realised Acorn had accomplished in four days what it couldn't get done elsewhere in two years, it got the contract — 'despite', says Hauser, 'the ranting and raving of Clive Sinclair'.



In its lifetime, the Acorn BBC Micro sold one and a half million models. And people noticed. 'Bill Gates tried to talk me into adopting his MSDOS,' says Hauser. 'He came to Cambridge and gave me a big spiel.'

Hauser didn't go for either the operating system or Gates' Basic interpreter. Wilson had knocked up his own interpreter which was considered superior in every respect. And then they compared Gates' MSDOS with their own operating system. `We said: "Bill, look, we understand that you're interested in selling us this operating system, but compare it to ours. We can't possibly take such a retrograde step.'"

Even then, says Hauser, Acorn's operating system offered things that are still missing from DOS today. All the parts of the system, including speakers and screen layout, could be controlled by commands. Furthermore, networking was built in.

`Acorn never sold a computer that didn't have a networking connection.' Kids in schools, says Hauser, could sit down and type 'I am Johnny' and be logged into the network.

The networking emphasis came from the Cambridge computer lab, where Andy Hopper, later a technical director at Acorn, had invented the Cambridge Ring long before Ethernet.

`The Cambridge Ring was always a lot better than Ethernet,' says Hauser, 'but the Ethernet was standardised. But because it was intrinsically better, it finally got its revenge.' Most of the findings from the Cambridge Ring, he says, have been adopted by what's now known as ATM (asynchronous transfer mode). 'I actually believe that ATM will become the LAN standard, because it's the only one I can see that will elegantly unify all the media you need to transmit within the home, office or wide area, or across the nation or globe. By different media, I mean telephony, TV, cable and computer data.' AT&T has recently announced it is to standardise its high end network on ATM.

So, Acorn had networking as long ago as 1981: another missed opportunity to create a standard. 'I think we could easily have standardised had we realised that standards were becoming important. Then in 1984 it was basically copied by Apple, and it's now called AppleTalk.' But, says Hauser, `There's no point in crying over spilt milk, because at that time it wasn't the vogue to do these strategic alliances. Had we gone for an alliance, I think we would have created a standard: we were technically way ahead of anybody else, both in terms of the basic computer and the way you network it.'

But Acorn was only part of Britain's early lead in computing. 'There were more home computers per head in Britain than anywhere else in the world, because we got started faster than the US. We just didn't keep the lead.'

1984 was the watershed year. Acorn had gone public with £200 million — and then came the collapse of the home computer market. 'It was the year when Atari was sold, Commodore was sold, Apple nearly went bust, and we solved the one problem that Acorn had throughout its history, which was to produce enough. We had them coming in by the lorry load, just at the time when the market collapsed, and of course the one thing we'd never had to do was turn the tap off.'

Acorn was in real trouble: it had commitments to ship some 250,000 unwanted computers. To the rescue came Olivetti, which bought 80% of the stock and is the second largest shareholder today.

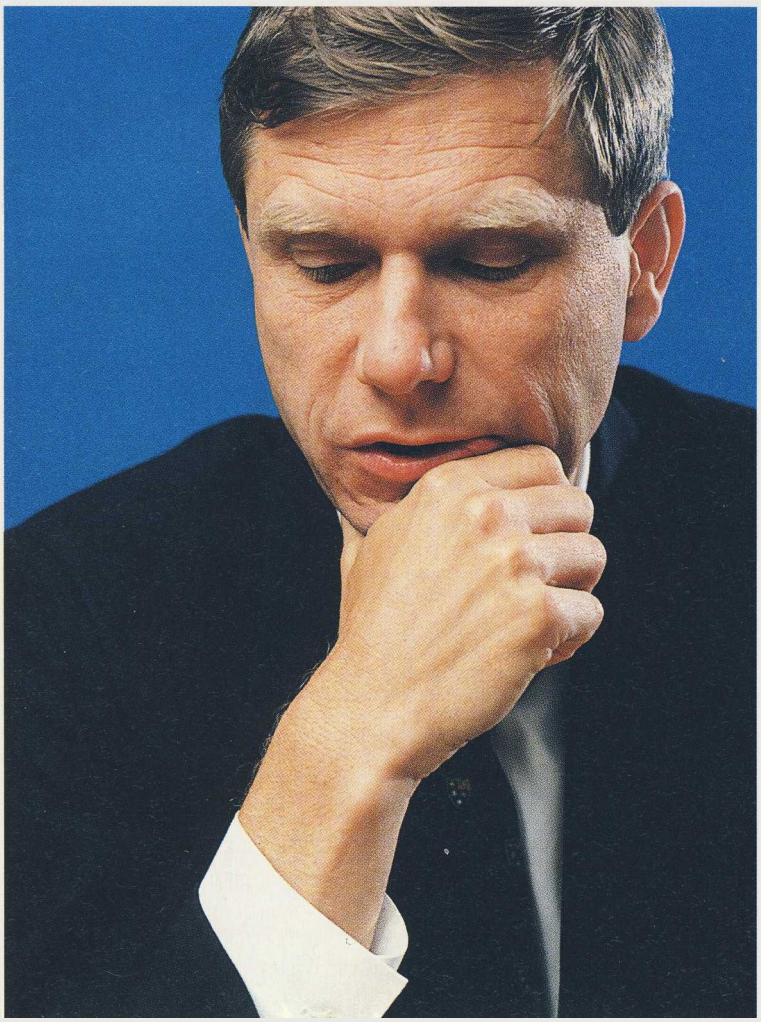
`I think there was a backlash,' Hauser says, `because nobody understood in the first place why people bought these computers by the handful. At the same time, IBM had brought out the self-correcting ribbon, and you could not explain to people that the computer would do anything else that would be helpful. I think we've got the same problem with personal communicators at the moment:

people don't understand that the diary can be such a vital part of your life because you can hang all kinds of useful connections off that diary entry.'

Hauser became vice president in charge of research for Olivetti. In 1986 he went to Italy for several years, where he supervised the setting up of several new laboratories on the company's behalf. Olivetti bought Acorn, he says, specifically for its technology. By this time it included the Acorn RISC Machine (ARM), which has since been spun off into the separate company ARM Ltd.

The ARM chip was part of a policy decision that a computer should be designed on silicon rather than cobbled together out of third party components. This focus, says Hauser, makes Acorn one of a small, select group of genuine computer companies (Apple being the most obvious) that own their own technology from the ground up.

`All the big companies — IBM, Olivetti, Bull —gave up their birthright. They're not producing computers any more; they're just assembling standard chips, and that's the reason behind the profit margin squeeze they have at the moment. It's like if you're a builder, who originally bought bricks from the brick company and built the house. But what happened in the computer industry was that the prefab people came along and started selling prefab components to the builders, and then they were only allowed to build the houses that the prefab guys gave them components for, so they couldn't build very good houses. If you actually look at the



Intel processor architectures before the P5 — the 286, 386 and 486 — they're some of the worst that have ever been around in the history of the industry. If you ask an academic or anybody who understands anything about microprocessors, they just happen to be incredibly successful because IBM made it a standard.

`We had a 486 in Acorn five years ago: something that had the performance of a 486, consumed one twentieth of the power, and had a million transistors instead of 300, 000, taking up one third of the space. There's just no way, if you compare like with like.' Acorn's operating system, of course, never had the 640K limitation of DOS.

The ARM was designed by the same people who worked on the first computer kit, and the pattern was the same: it worked sufficiently the first time to be debugged using the system itself. That first chip, Hauser says, had 30,000 transistors. That was the same number as a Z80 or the 6502 that Acorn used in its BBC Micros, but it was twenty times faster. It was also the world's first RISC processor.

`Now, again, we never thought of selling this processor to anybody else. It was only recently that we went out and tried to find some other companies to use it. We were successful with Apple, which has adopted the ARM for its Newton product range, and 3DO, which is now using it as part of a new video standard.' 3DO's backers in this project include Matsushita, AT&T and Time Warner.

This was the reason behind spinning ARM off as a separate company: companies would be less likely to use a processor that was owned and being used by a competitor. Acorn holds 46% of the stock.

The Active Book Company also intended to use the ARM for its line of personal communicators. Apart from the ARM chip and Hauser himself, he says this company and Acorn had nothing to do with each other. The company was set up in 1988 to exploit pen-based interfaces, which Hauser felt could really make a difference because they're so much easier to use.

At the same time, he says: 'We did not want to repeat the Acorn experience, where we created a computer which never really made the big time even though it was much better than anything that was on the market, simply because we didn't even try to talk to other companies. So, with the Active Book Company, I turned it the other way round: I talked to everybody in the industry.' The project really clicked with AT&T, which had something to offer the company that no-one else they talked to did: communications.

`AT&T at that time wanted to get into personal. communicators. It decided to do it with RISC technology, its own RISC chip, and there was one company in the world that had done that already.' AT&T wanted to run the project as a start-up company; this is now EO, which acquired Active Book. Hauser gives a lot of credit for EO to Kleiner Perkins, the venture capital firm that pulled together Go! and its Penpoint interface, AT&T, and Active Book into one company. But that's another story.

Hermann Hauser is now Chief Technical Officer and Chairman of EO Europe.