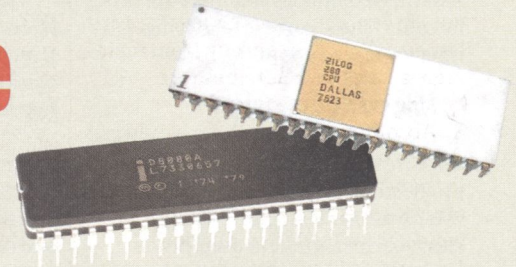


RETRO



Inspirational stories from computing's long-distant past

The chips were down – and the silence was terrifying



Exactly 45 years ago, the BBC broadcast a documentary that woke Britain to the invention of the silicon chip. It led to an important government decision, as **David Crookes** explains

“You’re going to see something absolutely amazing,” said the TV presenter Paul Vaughan at the beginning of a *Horizon* documentary that aired in March 1978. “A machine reading to a blind man.” Footage showed a man entering a building, placing a library book on to a scanner and using a machine to hear the words that were written on the first page.

Although the voice wasn’t entirely clear and the machine mispronounced some of the words, the narrator was making an important point. The technology, he explained, was built around a silicon microprocessor; something, he said, that would go on to revolutionise our lives. “They are the reason why Japan is abandoning its shipbuilding and why our children will grow up without jobs to go to,” he proclaimed. And Britain began to wake up to a new technological dawn.

That particular episode of the long-running BBC Two programme was called *Now the Chips Are Down* and it was hugely influential when it aired 45 years ago. In highlighting the importance of microprocessors for the British economy, and asking whether automation would prove to be a problem in the near future, it made the powers that be – most notably those in government – sit up and listen. No longer could they afford to ignore the rise of computers.

RIGHT You can watch *Now the Chips Are Down* on BBC iPlayer or at pcpro.link/343horizon

“The documentary was essential, perfectly timed and pitched to wake the UK from its ignorance,” said Steve Lowry, who had just joined the BBC as a studio engineer having studied electronic engineering at Southampton University.

“The chip was out there, approaching fast and it needed to be embraced and not ignored, particularly by the government. The documentary, quite rightly, did not mince its words and it wasn’t just a ‘classic’ *Horizon*, happy to educate and inform. It was also willing to ask the burning questions.”

■ Strike one

The 1970s had been difficult. It was a decade of strikes, one that would end with the winter of discontent. Inflation spiked, interest rates rose, there were energy blackouts and the UK faced its gravest economic crisis since the



ABOVE Steve Lowry of the *Computer Literacy Project* was inspired by *Now the Chips Are Down*

second world war. Under such circumstances, it’s easy to see why the government hadn’t paid much attention to silicon chips.

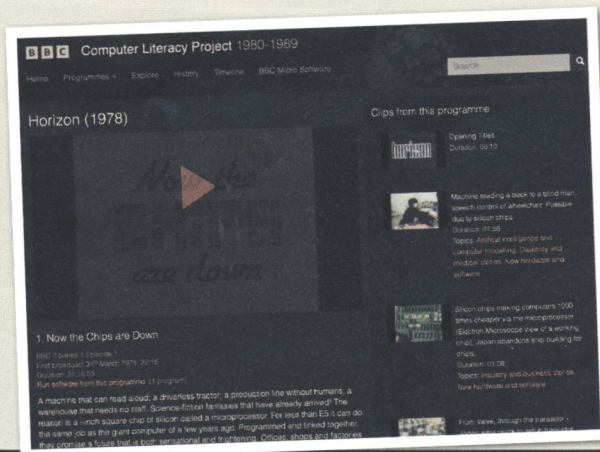
But it was important that it did. “The documentary struck a balanced tone and made the case to wake a slumbering James Callaghan government to the opportunity and threats that the chip brought with it,” Lowry said.

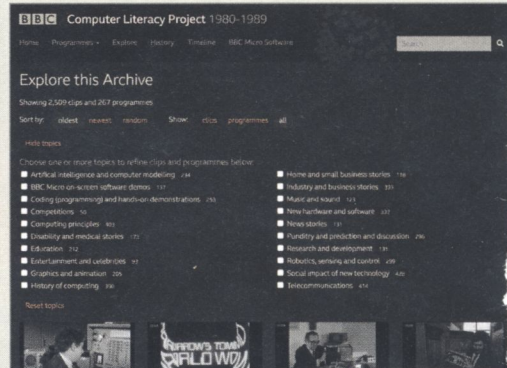
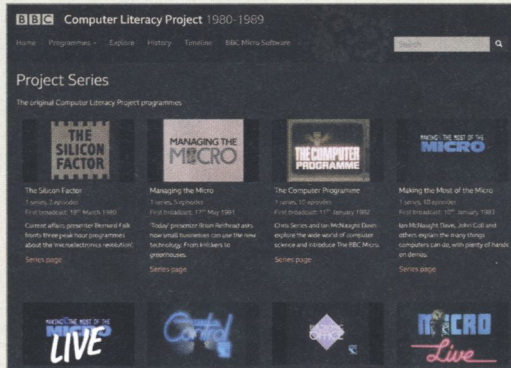
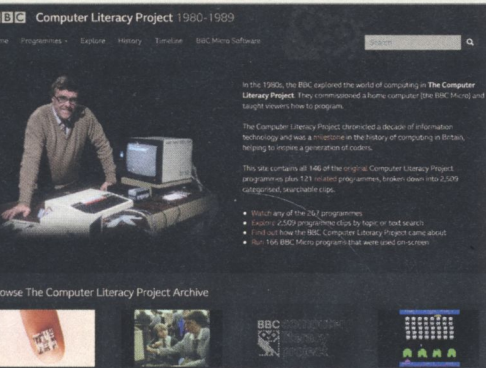
Indeed, having raised the issue of unemployment and whether we could all live on the wealth of automatic factories and the earnings of “an elite band of 60,000 software engineers”, Vaughan concluded the documentary with a series of thought-provoking issues that needed to be addressed.

“The questions are these,” he told viewers. “In the long term, when the only plentiful resource is going to be people, is automation the wrong road to take? Could this technology be the end of an age; the end of a line of evolution and not a beginning?”

“But in the short term, can we afford not to automate? If we don’t, won’t our industry be disadvantaged by the automated industries abroad? And if we do automate, will we be able to cope with the problems of large-scale unemployment? Perhaps the survival of the nation depends on its people finding meaningful lives.”

Vaughan wrapped up with two sentences that hung in the air as both a rebuke and a warning. “What is shocking is that the government has been totally unaware of the effects





that this technology is going to create,” he said. “The silence is terrifying. It’s time we talked about the future.”

■ Micro aggression

As the screen faded to black, it sparked a debate and concentrated minds. “The programme showed what the chip was about in classic BBC style with clear, correct, audience-embracing material – it was informing, educating and entertaining without being patronising or distracting the audience with padding,” said Lowry.

“It most certainly enlightened ministers about the microprocessor and led to greater awareness of what it was all about. It kickstarted initiatives to educate, embrace and democratise this wonderful new technology.”

This was due, in no small part, to a spooked government asking the BBC if it could raise further awareness. “The programme had got various government departments, quangos, educational departments and the BBC thinking,” Lowry said, and this had

prompted the influential Manpower Services Commission quango to make an approach.

Sheila Innes was the BBC controller for educational broadcasting

and she asked two members of her team, David Allen and Robert Albury, to investigate, saying: “There’s this thing called micro-electronics. I want you to see if there’s anything in it.”

The resulting inquiries took the pair to Japan, Netherlands, Sweden, Norway, Germany and the US, where they saw advanced industrial processes, flexible manufacturing, robots in car factories and heard from unions.

“The Manpower Services Commission was worried that we weren’t taking technology seriously as a country,” said David Allen. “The Germans were calling the silicon chip the job killer and research showed that a public awareness campaign was needed. It was a case of, look, this technology is coming along and you really need to get your hands on it and learn what it does otherwise it will dominate you.”

David says the conclusion of the Microelectronics report published in December 1979 (pcpro.link/343report) was that UK industry effectively needed to get off its backside.

“Overall there seems to be little doubt that micro-electronics is a desirable technology, but that it will lead to considerable dislocations and structural unemployment,” the report said.

In that sense, *Now the Chips Are Down* had done its job. It had laid the groundwork, caught the attention of the right people and whetted appetites for practical uses of the technology. But now it was clear that the UK needed to get up to speed – and fast.

In fact, the documentary showed that an area of California – Silicon Valley – was stealing a technological march thanks to the efforts of Stamford University and Fairchild Semiconductor. There were also warnings that some industries were ill-prepared: the mechanical calculator industry “didn’t know what had hit them” when electronic calculators became commonplace, and there was a danger that other industries would be similarly hurt by the rise of the microprocessor.

Fiat was already using robots to make cars, tractors could plough without a driver and “two or three word processors could do the same volume of work as ten typists”. Supermarkets in New York were ditching mechanical registers for “point of sale terminals” that could

ABOVE The Computer Literacy Project is now five years old and packed with content

check the validity of a credit card, check stock and order from automated warehouses.

“By my final year at university, it had been clear to me that the chip was going to be a game changer for everyone, not just for personal computing but in every aspect of progress and life,” Lowry said. But what could the UK do?

■ Educating Britain

This was the question buzzing around government, education and BBC circles, and it was decided that the broadcaster was well placed to educate the nation further about computing and help raise awareness.

The aim was to demystify the new technology and ensure that people wouldn’t feel dominated by it. This initially led to the production of another programme, *The Silicon Factor*, which was a

three-parter broadcast in 1980 aided by £10,000 of government funding.

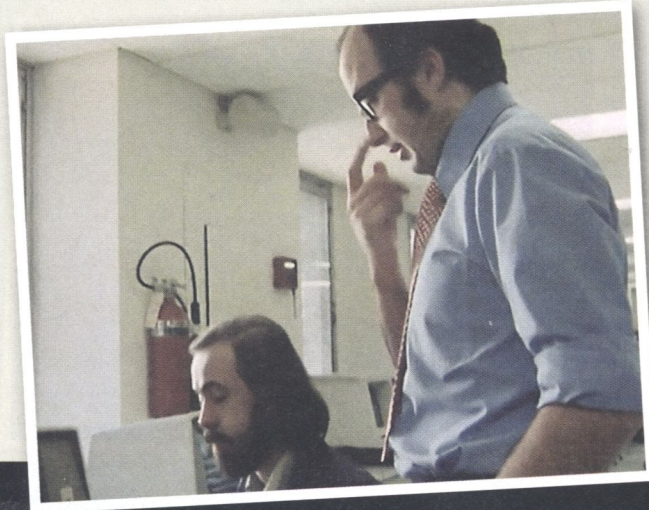
By this time, Margaret Thatcher was in power, and the programmes explored the rise of microcomputers. The emphasis was turning away from how computing would adversely affect people and it was leaning more towards practical issues about how the machines could be used and controlled. The aim was to get people to touch and use computers.

Before long, a ground-breaking initiative called the Computer Literacy Project emerged that was backed by the government and the BBC. One of the key components of the project was the commissioning of a new computer, so the broadcaster turned to British electronics companies, with Acorn emerging victorious having seen off competition from Sinclair and Dragon.

The resulting BBC Micro became the focus of many subsequent television programmes and books, but Lowry says none of this would have happened had it not been for the *Horizon* documentary.

“The BBC Micro became the focus... but none of this would have happened had it not been for the *Horizon* documentary”

BELOW *Now the Chips Are Down* showed how UK developers were making money



“Now the Chips Are Down is the programme that had prompted the government to put computers into schools,” said Lowry, who joined the BBC Computer Literacy Project team in September 1982.

The Computer Literacy Project ended up comprising 146 programmes and, while Lowry wasn’t involved in early shows such as *Managing the Micro* broadcast in May 1981 and *The Computer Programme* in January 1982, he became an integral part of subsequent series from *Making the Most of the Micro* onwards.

■ The other side

Rival broadcaster ITV was also taking notice of this march towards educating Britain about computing, and it too created a memorable series. Aired in 1979, *The Mighty Micro* was presented by computer scientist Professor Christopher Evans and he too foresaw the microprocessor’s role in a much-changed society.

“It’s an era when we will amplify the power of our brains many, many times in the way the machines of a hundred years ago amplified the power of our muscles,” Evans said in episode one.

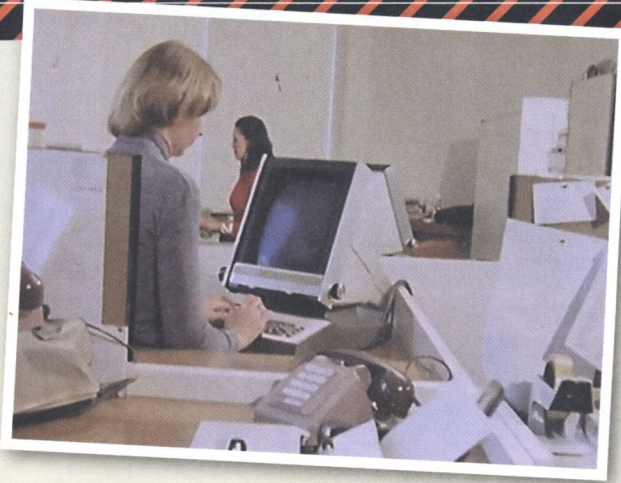
He went on to explain the significance of the microprocessor and explored how the space race had led the US to be at the forefront of technology. He demonstrated how silicon chips would mean robots would take on many jobs.

“Any industrialised country [that] wants to maintain its living standards in the 1980s, let alone the 1990s, is going to have to look at robots and their possibilities quickly,” he warned, later saying that working lives could be overturned.

“The series reinforced and expanded on the points made in *Now the Chips Are Down*,” said Lowry. “It chose a different pace and took much time to explain historical context before considering the aspects of the chip that Christopher Evans had views on.

“In 2023, because *The Mighty Micro* included much more prediction and punditry, this series’ content has aged more, although it’s fascinating to hear predictions such as a 20-hour working week, the end of conventional wars and strife, many conventional school teachers being replaced by superior teachers and a totally cashless society occurring within a few decades.

“I was left with the impression that the chip was not that inclusive, though, and that computing from the 1980s onwards might still only be in the hands of the few. Yet it raises something key: that the BBC’s Computer Literacy Project



was all about inspiring everyone to the potential of the chip. It didn’t put fear in the viewers’ hearts but highlighted opportunity – an opportunity for everyone to embrace the personal computer revolution.”

■ Future is now

Today, Britain is known as one of the world’s leading technology nations. Although companies such as Sinclair and Amstrad (the latter once having a 40% market share of the PC market) have come and gone, the many computers that were made here inspired a generation and laid down the foundations of a flourishing industry.

The BBC Micro inspired Eben Upton, for instance, who became one of the founders of the Raspberry Pi Foundation. In addition, the ARM processors used in a multitude of smartphones and tablets today are created by a chip designer that spun off from Acorn.

According to recent government figures, the UK tech sector is number one in Europe and number three in the world after the US and China, with a combined market value of \$1 trillion. The UK is also home to some of the globe’s biggest video game developers, including Rockstar, makers of *Grand Theft Auto* (with *Tomb Raider*, *Lemmings*, *Micro Machines*, *Wipeout* and *Populous* born in Britain, too).

“The 1980s was about computing,” said Lowry. “Our national character loved what we could do with computers and, with our home micros under our control, we saw the start of



ABOVE One of the microprocessor’s killer apps was word processing

“The 1980s was about computing... We saw the start of the UK computer games industry, the rise of custom chips and ARM”

BELOW The BBC Micro was inspired by the Computer Literacy Project

the UK computer games industry, the rise of custom chips and ARM.”

Many developers over the years have cited the Computer Literacy Project as an inspiration. “David [Allen] and I have met so many people who have made a point of searching us out to thank us for how much the Computer Literacy Project inspired them and took away some of the fear,” Lowry said.

Determined not to allow the project’s memory to fade, he and Allen began working on a huge archive of all 146 programmes (including *Now the Chips Are Down*) plus 121 related programmes in 2015. The idea had been floating around for four years – “David planted the idea when he visited me at BBC Elstree,” Lowry said – but it only truly got under way once Lowry retired.

The Computer Literacy Project Archive eventually launched on 27 June 2018 at the National Museum of Computing, Bletchley Park, and the BBC has hosted it online these past five years. It allows people to enjoy

2,509 searchable clips, 166 BBC Micro programmes and lots of information. There’s little doubt it has become a labour of love.

“I continue to curate any BBC TV and radio programmes relevant to computer literacy in an offline version of the Computer Literacy Project Archive,” Lowry said. “As of January 2023, I have curated a further 120 relevant BBC programmes in addition to the current collection of 267.”

Those extras are yet to make it to the online archive since the BBC would need to clear any copyright hurdles, a task that would take time and cost money, but Lowry is optimistic that they will be added at some stage in the future.

In many ways, the archive represents a true blast from the past. “It would appear that broadcasters are less brave now than in the 1970s and 1980s; less willing to inspire and inform, at least in any kind of depth, the potential of IT in these current times,” Lowry said.

“The BBC can no longer afford the strong educational links it had 45 years ago and, even in BBC Radio, the number of inspirational science and computing programmes has been reduced. That is a shame and bad for the UK where we have such a strong base of people who could be inspired and better informed.” ●

■ The Computer Literacy Project Archive is at clp.bbcrewind.co.uk