

# Videogames Hardware Handbook

From the  
creators of  
**retro\***  
GAMER

**20+**  
classic  
machines



1980 to 2001  
Consoles □ Computers □ Handhelds

## The Games Machine Collector's Manual



ACORN ELECTRON



NEO-GENO



AMSTRAD CPC 6128



PLAYSTATION



SINCLAIR ZX80



ATARI 5200



AMIGA 500



GAME BOY



ATARI 800XL



GAMECUBE

**Digital**  
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OVER 20 YEARS  
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NOSTALGIA INSIDE



SEGA SG-1000



NES



AMIGA CD32

FUTURE  
VOLUME 2  
FIFTH EDITION

# Videogames Hardware Handbook

The Games Machine Collector's Manual



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PlayStation



NES

THE VERY BEST RETRO HARDWARE



AMSTRAD CPC



# AMSTRAD CPC



With a staggering 3 million sales, there is no doubt the CPC range of computers was a success for Amstrad, even if it trailed behind all of its competitors. We take a look back at why we should learn to love Lord Sugar's plucky little underdog

These days, a new product is a failure unless it attracts a queue around the block a week before it arrives in the shops. It is common to see bedraggled shoppers wrapped up in sleeping bags, carriers filled with nibbles and anxious fingers drumming on warm cups of takeaway coffee.

It would be nice to say the same happened for the Amstrad CPC 464. It didn't – or it certainly didn't to the same degree. Some 60 shoppers waited outside retailer Rumbelows in London's Edgware Square for an hour when the 464 launched on 21 June 1984, although they "rushed forward" when the doors opened at 9.30am, according to *Amstrad CPC 464 User* magazine. By 10.30am 100 computers had been sold, but that kind of thing was deemed a success.

After all, this was only the beginning and similar stories were being told up and down the country. In competing on convenience (Amstrad made much noise about having a green screen or colour monitor bundled in the same package as the keyboard/computer)

and price (the 464 cost as little as £239, the price dropping to £199 months later), the CPC became, what the *London Evening Standard* had called the "People's computer", a machine that consumers were willing to hire rather than fire. By the end of 1984, 200,000 units had been sold.

But the story started in 1983 when Sugar – or Lord Sugar as he is known today – was in rather bullish mood, buoyed by considerable sales of his range of hi-fis. These all-in-one units did away with having to buy separate record players, tape decks and radio receivers and it was this allied with the Apple II clones that Amstrad was repeatedly offered for rebadging on its purchasing trips to the Far East that got the London entrepreneur's brain whirring. Lord Sugar felt there was a gap in the market that he could fill.

"So many computers were being aimed at people in technology but the market for the CPC was the lorry driver and his mate," says former group technical manager Roland Perry. "The idea was that the CPC should be a complete ready-to- ▶





## AMSTRAD CPC

# LORD ALAN SUGAR

Lord Alan Sugar is not known for his forgiving, sentimental nature but, exactly 30 years after he launched the CPC 464, he took to Twitter to profess: "11 Apr 1984 was a proud day for me". It led to a number of fellow users pointing out that Amstrad is no more today but Lord Sugar hit back. "Many asking 'Where is Amstrad now?'" he wrote. "I sold Amstrad to Sky for £125m in 2007". We briefly caught up with him about the time in between



Photo courtesy of Damien Everett

### Why did you decide to enter the home computer market?

I spotted that this was a massive growth market and it had suppliers that tried to make it sound like they were offering something special where hardware was concerned. They weren't. We took what we knew in consumer electronics and recognised that we could make them easily and add features and value to make the unit look like a computer and not a pregnant calculator.

### Did you have a strong idea about what you wanted the computer to be?

A value-for-money unit that offered a fully integrated system of monitor and data recorder so that you didn't have to plug it into a television.

### Was it important for the Amstrad CPC 464 to be an all-rounder?

We made the computer look like a computer and that is what the consumer warmed to as it was

not only a good product but it showed true value for money and [consumer's felt] they were buying a real good lump of hardware.

### Were you surprised at its take-up, especially in France?

The computer took off well in France as it was a serious looking machine. It became one of our biggest markets.

### Why did you buy Sinclair?

We bought Sinclair for its name but also to transform the unit with an integrated data recorder and to make it a proper computer. That's why we sold millions of them and followed on in other markets with the Sinclair success of branding. It allowed Amstrad to move on to more serious computing.

### More than 30 years on people are still writing games for the CPC – did you ever expect that?

It is absolutely fascinating to see that the CPC still has a following 30 years on.

» Amstrad snapped up Sinclair, thereby swallowing its closest British rival – angering Speccy fans in the process.

» A big thanks to [www.consolepassion.co.uk](http://www.consolepassion.co.uk) for kindly lending us a machine for hardware shots. Thanks guys.



» go machine; that you shouldn't have to roll around the floor plugging and unplugging things."

With this in mind, the CPC team aimed for simplicity. Lord Sugar had no experience of making computers so he assembled a team that could. Key players were Roland and his childhood friend, William Poel, both of whom were interested in computing and had lots of electronics experience. They took inspiration from the ZX Spectrum and C64, pitching a machine into the same bracket with similar specifications, and by the end of 1983 a prototype was ready.

"We had a prototype at Insight Software in St Helens," says programmer Paul Hughes. "It was pretty much of the final form factor when we got it, bar some bits Dremeled out where the mouldings didn't quite fit. If I remember correctly, there were some extra

components and wires soldered on to the PCB to fix teething problems before final manufacture but, all in all, it was pretty much there."

The CPC 464 was unveiled in Westminster School, London, on 10 and 11 April. It had an integrated tape deck and 64K of RAM, expandable to 512K – dK'Tronics sold memory packs but no games took advantage. It allowed for 27 colours in three different resolutions: 160x200 with the use of 16 colours on the screen at once, 320x200 with four colours and 640x200 with two colours (more commonly known as modes 0, 1 and 2). It ran with a 4MHz Z80 processor (in line with the Spectrum) running at 3.3MHz due to tech restrictions created to avoid display snowing. It had an AY-3-8912 sound chip that was nowhere near as good as the celebrated SID chip of the Commodore 64, but



» Like other 8-bit computers, it was possible to add a number of useful peripherals to the CPC.



» As you may have guessed, this is actually a Spanish CPC 464, giving a good indication of the machine's global reach.

## “ The CPC also came with a welcome tape which I wrote with my fair hands ”

Roland Perry

headphones could be plugged in for stereo sound. There were colourful keys on the dark grey keyboard. The CPC would output PAL-frequency analogue RGB to the boxy, 14-inch monitor via a 6-pin DIN connector. The monitor also contained the power supply. Later, a bundled TV receiver peripheral was released that allowed the monitor to tune into analogue television signals. “The CPC also came with a welcome tape which I wrote with my fair hands,” recalls Roland. “You’d insert that, press Play and it would load and you’d see whizzy rays of sun. It looked like it was doing something straight away.”



Software was important for Amstrad, the company figuring that the CPC needed a good range of readily available titles from day one. The CPC 464 came with 12 titles that the company claimed was worth more than £100. They included *Roland In The Caves* and *Roland On The Ropes* – two titles from a series named after Roland Perry – as well as *Bridge-It*, *Oh Mummy*, *Harrier Attack*, *The Galactic Plague*,

*Sultan’s Maze*, *Fruit Machine* and *Xanagrams*. It also came with the word processor, *Easi-Amsword*. “We distributed between 40 and 50 prototypes to developers and they busily converted Spectrum and C64 games,” continues Roland. Amstrad founded a publisher called Amsoft to sell titles for the CPC 464 and it helped stoke the fires of competition. Indeed, when Acorn took out ads that quoted reports about the unreliability of Spectrums, much to Sir Clive Sinclair’s ire, Amsoft commissioned a game called *Business Is War* to parody the fight between the two. Programmer Marcus Altman of Alligata had a disaster and lost the source code so it was never released but lots of other games were. “One of the objectives was to launch the computer with 50 games available,” says Roland. “You couldn’t just launch a computer and say there would be lots of games along for it real soon – you had to produce the whole package.”

Spectrum ports were not to everyone’s taste, though. Games converted directly from Sinclair’s machines to the Amstrad were often slower and had fewer colours.



The similarity between the two machines was one of the reasons why developers ported but time and cost were the overriding factors. Porting marred games such as *Strider*, *Hard Drivin’* and *Vendetta*, but without it such games may never have seen the light of day on the Amstrad. The CPC was the subservient machine in terms of sales in the UK and it wasn’t always easy to produce Amstrad versions. “I found creating loading screens on the Amstrad a bit harder than making something on the Speccy,” says graphic artist Mark Jones who produced the Mag Max loading screen for the CPC. “Not only did I have to work in colour, which I hadn’t done before, I had about three days to do it. Simon Butler gave me a crash course on anti-aliasing, where you put colour between two touching colours to make the lines less jagged, and away I went. You never had to anti-alias with the Speccy.” It was notable that in Spain and France where the Amstrad dominated, porting was far less common.



« Roland Perry was the technical guru brought in to work on the CPC 464. He worked on all of the other CPCs too.

## KEY EXCLUSIVES Five fantastic games that helped define the CPC range



### SORCERY+

PUBLISHER: Virgin/Amsoft  
GENRE: Arcade adventure  
RELEASED: 1985

■ *Sorcery* was good; *Sorcery+* was better. In adding new screens and developing an extra chapter, Virgin put together a gripping, smooth and addictive disk-only sorcerer adventure that beat the original in every way possible. It combined the CPC’s low-res Mode 0 with a higher-res Mode 1 making for absolutely perfect presentation.



### GET DEXTER

PUBLISHER: ERE Informatique  
GENRE: Graphic adventure  
RELEASED: 1986

■ Made in France, the CPC’s primary market – and where this game was known as *Crafton & Xunk* – *Get Dexter* was an isometric, puzzle-solving adventure exclusive to the CPC for around a year. Well-loved, its intricate nature stood it out: destroy a robot, for example, and it exploded with a splash, making the floor mightily slippery for poor Dexter.



### MEGA BLASTERS

PUBLISHER: Radical Software  
GENRE: Action  
RELEASED: 1988

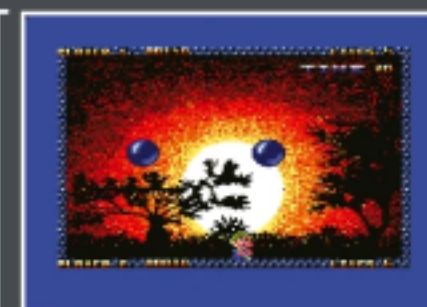
■ Sold towards the end of the CPC’s life via mail order, *Mega Blasters* – a clone of *Super Bomberman* – became so highly regarded, it was named the best Amstrad game of all time by members of the CPC Wiki. It’s a mega game in every sense, it was spread over 90 levels and it took in 11 worlds. Given it took up 900K of data, it was disk-only.



### BURNIN’ RUBBER

PUBLISHER: Ocean Software  
GENRE: Driving RELEASED: 1990

■ Amstrad needed a title that could be bundled with the GX4000 and Plus range of computers and it found it in *Burnin’ Rubber*. Graphically head-turning but sonically ear bending, it was made by Ocean. The dev team seemed to unleash its creativity to produce the best-looking Amstrad game at the time. It boasted subtle shading and had a distinct 16-bit feel.



### ZAP’T’BALLS

PUBLISHER: Elmsoft  
GENRE: Arcade RELEASED: 1992

■ *Pang* was released solely on cartridge when the ball-popping game finally surfaced on the Amstrad so Elmsoft stepped forward with a CPC version that looked anything but normal. With experience in the boundary-pushing demo scene, Elmar Krieger gave the game a graphical flourish, yet the gameplay was criticised in the UK – much to the annoyance of European CPCers.



► The built-in tape deck proved so popular for Amstrad that it did exactly the same thing when it released the ZX Spectrum +2.



► (Amstrad CPC) Amsoft's *Doors Of Doom* was a nerdy platform-style game that proved to be rather difficult going.



► (Amstrad CPC) With big name backing, games like *Space Gun* showed the capabilities of the Amstrad CPC.

and *Day 2*, *Quabballah*, *Tubaruba*, *World Series Baseball*, *Monopoly*, *Cluedo*, *Scalextric*, *Scrabble* and *Trivial Pursuit*, a rather solid selection of games that proved to be a reasonably good introduction to the CPC.

Both the 464 and 6128 proved to be an eventual hit for software developers. Ocean Software's David Ward said the Amstrad user base was newer and more active than those of other machines. "They buy more software," he said. Most games were released on both tape and disc in the UK but in France discs were more popular so many of their releases did not get an airing on tape and they tended to be 128K-only.

There was a feeling at times that the CPC was a money-making machine first and foremost, though. Lord Sugar was never interested in producing a cutting edge computer ("It doesn't put money in the bank," he told *Amstrad Action*) and he wasn't particularly interested in market share even though, by 1985, the Amstrad CPC had 25 per cent of the market ("I could have 100 per cent of the market in thimble holders but it wouldn't make me any money, would it?" he said). Neither, it seems, was Lord Sugar all that interested in powering up the blue

► Amstrad did try and encourage original games, though. Lord Sugar invited the top software publishers to his offices in Brentwood, Essex. He took them to a warehouse where he showed them the CPC 464 hoping to persuade them to develop but although many were impressed, even by March 1985, games for the CPC were hard to come by, making Amsoft even more crucial. One of those in attendance at that meeting was Geoff Brown, founder of US Gold. "I had never met Alan Sugar before then but I had heard about his blunt speaking reputation," he says. "It was obvious he knew nothing about computers, except selling them, and nothing about the games industry or its game fans." Geoff told Lord Sugar about the coin-op conversion of *OutRun* which had zoomed to the top of the charts for other formats. He told the Amstrad boss he would go back to Sega and

## "I had never met Alan Sugar before then but I had heard about his blunt reputation"

Geoff Brown

ask for extra permission to port the game to the CPC 464. "He snarled back, 'bloody driving game; we can easily get one of those written, no problem'," says Geoff. "He told me he didn't need coin-op conversions or licences." The big games did eventually come in droves, though. Indeed, *OutRun* became one of the biggest successes on the Amstrad in 1987. Sadly, it was an awful conversion with a slow pace and ugly sound effects.

By this time, the CPC had evolved into a small family. The CPC 664 was

identical to the 464 except it came with a disc drive instead of tape (and was incredibly ugly with light blue keys). It was ditched within months to make way for the 128K CPC 6128. Other than the extra memory and the disk drive, it retained the core of the 464's tech complete with monitor and it retailed for £299 (green screen) and £399 (colour). It also had a tape port so that a cassette deck could be plugged in. Gamers could enjoy the likes of *Doors Of Doom*, *Hunchback I and II*, *Roland In Time*, *Nomad*, *Supertest - Day 1*

# THE CPC RANGE



### CPC 464

■ From the early white prototypes came the dark grey 464. Boasting a Z80A processor, 64K RAM, 27 colours, three screen modes ranging from 160x200 to 640x200 and support for up to two joysticks, buyers had a choice of colour or green monitor. And gamers cried if their parents got the latter.



### CPC 664

■ The 664 was an ugly, 3-inch disc drive version of its cassette-based sister with some lurid blue keys and the same 64K of memory. It remained on the shelves for just five months and sold 10,000 units. But it introduced AMSDOS and came with CP/M 2.2, and it allowed games to run faster.



### CPC 6128

■ A slimmer and more stylish computer than the 664, the 6128 doubled the memory and removed the colourful keys, making for a more serious-looking offering. "It's definitely not a Mickey Mouse machine," Lord Sugar said at the time. It became the computer of choice in France with some great, disc-only exclusives being made.

Photo courtesy of Bill Bertram

screen himself. Roland says Lord Sugar did not have a 464 on his desk but that he never expected him to. "Does the MD of a bicycle factory have to ride a bike to work?" Roland asks. "He can afford a Jaguar with a chauffeur. Alan was not the target market for the computer and he was building machines for other people, not himself."

But for those who used the machine, it opened up creative possibilities thanks to Amstrad wanting to have as open a system as possible. "We wanted people to use the machine and not feel that what was happening inside it was mysterious," says Roland. It worked well. "The CPC sat nicely in the midst of the computers that came out in the Eighties," says developer Philip Oliver. "It was cheaper and more accessible than a BBC Micro, with a better keyboard and graphics than a Spectrum. It was more British (and better) than the Commodore 64. We used the CPC to develop *Super Robin Hood* and we led on the CPC for all our games after that." To foster loyalty to the CPC and lend a helping hand, Amstrad formed an Amstrad User Club. It included a subscription to *Amstrad Computer User* magazine, which encouraged people to program ("We pay well," said an editorial in issue 10). "We



• Rod Lawton was Amstrad Action's longest serving editor from December 1983 to February 1993.

paid a lot of attention to making a computer that people could program themselves," said Roland. "The manual wasn't just about telling you where to plug things – it had a lot of stuff about Locomotive BASIC and it had tutorials. Programming was important to us."



The main independent publication, *Amstrad Action*, was also instrumental in building support but former editor Rod Lawton was acutely aware that the CPC was often given a rough ride. "We got on pretty well with the Spectrum community, even though we thought the computers (and the users) were a bit weird," he says. "It seemed all right for geeks and home programmers, but we thought the CPC was more of a finished product. The C64 was a different kettle of fish. It was an American import, it was used by gaming fans who thought they were a cut above the rest of the 8-bit

community, and we kept our distance. They were like, 'yeah, obviously, the C64 is much better for games,' and we were like, 'yeah, whatever'."

By 1990, six years after the CPC 464 had launched and five years after the 6128, Amstrad took the range in a new direction. Noticing the console market was growing, it redesigned the casing of the two machines and added a cartridge slot. The computers were relaunched as the 464 Plus and the 6128 Plus and there was a standalone console called the GX4000 that was styled like a spaceship. Suddenly, Amstrad wanted something more cutting edge – except it failed to deliver.

"All kinds of people were trying to adapt their general purpose computer designs to compete with games consoles so we tried the same," says Roland. "I think, in hindsight, that the only thing to do was design a console from scratch

and not try to bolt functionality to what we had."

The computers ran into problems straight away. A handful of existing games were not compatible which deterred a few potential upgraders. The 6128 Plus did not have a cassette deck port. But the instant loading cartridge slot, the 4,096-colour palette and the 16 hardware sprites, hardware scrolling, programmable interrupts and DMA for the AY soundchip certainly pushed the new CPCs closer to the Atari ST and Amiga. The bundled game, *Burnin' Rubber*, looked delicious.

It wasn't enough. Poor sales of the computers and the console – which was being discounted by £30 within six months – ensured there were too few games (and those that were released tended to be ports). The CPC was no more and Amstrad moved on. Developers found a way of harnessing the Plus capabilities with disc and tape-based games which ensured buyers hadn't wasted their money (benefiting from *Space Gun*, *Fluff* and *Prehistorik 2* among others) but it was clear the 8-bit era had come to a close.

During the Eighties, though, the CPC had become France's best-selling computer. The range had swallowed up 50 per cent of the market, selling 650,000 machines. In total, the CPC sold 3 million across the world and while that was fewer than the 17 million C64s and 5 million Spectrums, it was enough to ensure it was the third 8-bit machine and enough to declare it a resounding success.



• The colours were garish, but having a built-in tape deck was extremely useful. It was surprisingly hardy as well.



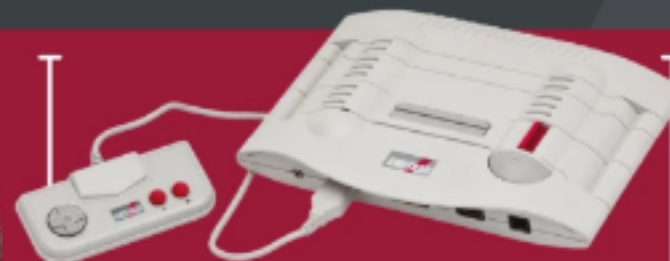
### 464 PLUS

■ In 1990, Amstrad replaced the CPC range with the restyled Plus machines. The 464 Plus looked Amiga-esque and it had a slot for cartridge games as well as a tape deck. It came with a game controller paddle, the game *Burnin' Rubber* and a monitor. The Plus features allowed the use of a palette of 4,096 colours.



### 6128 PLUS

■ Like the 464 Plus, the 6128 Plus was basically the old CPC 6128 in a new style with a cartridge slot. The extra capabilities were supposed to be for cartridge games only but programmers were able to get around that. The 6128 Plus did not have a tape deck port, which persuaded a fair few against upgrading.



### GX4000

■ Amstrad's 8-bit console had a Z80A processor running at 4MHz – identical to the CPC – but it had a Direct Memory Access controller so music could be played without burdening the processor. With 18 hardware sprites, 4,096 colours (32 displayable at once) and smooth scrolling, it would have been a hit – five years earlier.



### CPC 472

■ It claimed to have 72K of RAM but it only allowed 64K to be accessed and it was designed to get around Spanish import tax laws. It said the extra memory supported BASIC. It didn't. The 474 did include the CPC 664 ROM with Locomotive BASIC 1.1, though. And Spanish keyboard versions added a statutory 'tilde' key.

Photo courtesy of Evan Amos