

Units for measuring computer memory

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Memory is often an overlooked factor in PC performance. Even the most savvy DIY computer fixers among us make mistakes when it comes to diagnosing their computer troubles. If you've ever made an incorrect assessment about solutions to your slow computer issues, you're not alone.Most American computer owners know enough to try pressing restart and installing new updates, but when we have to dive in and get our hands dirty, do we opt for the right solutions? My company, Crucial.com, recently asked 1,000 Americans just how much they know about fixing their computers, and the results were surprising.Although almost half of the men surveyed said they feel confident when it comes to fixing computers, a large majority underestimated the best solutions to their most common computer problems. While slow computer problems can be attributed to insufficient computer memory, or RAM, less than 10% of men identified adding memory to their PCs as one of the most likely ways to help things run faster. When given five classic symptoms of stalling computers, men were most likely to identify component failure as the most likely cause instead.Women did not fare much better: More than 90% of female respondents failed to identify memory upgrades as the most likely culprit. Not only are Americans misinformed about what's causing their computers to slow down, but they don't know what to do to fix the problem.What this meansIn essence, the research shows today's consumers are connecting slow computer troubles to all the wrong issues. More than 90% of survey respondents overlooked low memory as a contributor to computer speed problems.We often get frustrated when our devices slow down, but we don't know how to make them run faster, often going overboard and purchasing an entirely new computer that will cost hundreds (and in some cases thousands) of dollars. This expense can be spared with a bit of research into the causes of the problem.Most survey participants were quick to guess that a failed component inside the computer was causing their machines to stall. While this is a common response, it can be a pricey fix. And it could even be costlier for those that assume the only way out of the situation is to replace their computers entirely: 52% of survey respondents said they would replace their PC altogether if it exhibited unacceptable performance by being slow, broken or out-of-date. That's a large price to pay if the problem was misidentified in the first place.Not only do Americans struggle with identifying the sources of their computer problems, but they also have delusions when it comes to finding a correct price mark. Almost three in four of the survey's respondents said they are highly concerned with saving money, and yet 41% said they would be willing to invest more than \$100 to repair or replace an ailing computer.Who among us would deny an interest in saving money? While the data shows undeniably that Americans prioritize money saving, the impulse to simply scrap a slow computer in exchange for a brand new, expensive one is one that consumers must work to suppress. Consumers who do even a modest amount of legwork to explore cost-effective solutions like upgrading memory stand to solve their slow computer woes.Kicki Lindahl-Crozier is a Tech Support Guru for Crucial.com (opens in new tab) Most forms of computer memory are intended to store data temporarily. Take a look inside your computer with computer memory pictures. Brandon Goldman / Getty Images When you think about it, it's amazing how many different types of electronic memory you encounter in daily life. Many of them have become an integral part of our vocabulary: You already know that the computer in front of you has memory. What you may not know is that most of the electronic items you use every day have some form of memory also. Here are just a few examples of the many items that use memory: Cell phonesPDAsGame consolesCar radiosVCRsTVs In this article, you'll learn why there are so many different types of memory and what all of the terms mean. On the next page, let's start with the basics: What exactly does computer memory do? Drum memory, an early form of computer memory, used the drum as a working part, with data loaded to the drum. The drum was a metal cylinder coated with a recordable ferromagnetic material. The drum also had a row of read-write heads that wrote and then read the recorded data. Magnetic core memory (ferrite-core memory) is another early form of computer memory. Magnetic ceramic rings called cores, stored information using the polarity of a magnetic field. Semiconductor memory is computer memory we are all familiar with, computer memory on an integrated circuit or chip. Referred to as random-access memory or RAM, it allowed data to be accessed randomly, not just in the sequence it was recorded. Dynamic random access memory (DRAM) is the most common kind of random access memory (RAM) for personal computers. The data the DRAM chip holds have to be periodically refreshed. Static random access memory or SRAM doesn't need to be refreshed. 1834 - Charles Babbage begins to build his "Analytical Engine", a precursor to the computer. It uses read-only memory in the form of punch cards. 1932 - Gustav Tauschek invents drum memory in Austria. 1936 - Konrad Zuse applies for a patent for his mechanical memory to be used on his computer. This computer memory is based on sliding metal parts. 1939 - Helmut Schreyer invents a prototype memory using neon lamps. 1942 - The Atanasoff-Berry Computer has 60 50-bit words of memory in the form of capacitors mounted on two revolving drums. For secondary memory, it uses punch cards. 1947 - Frederick Viehe of Los Angeles applies for a patent for an invention that uses magnetic core memory. Magnetic drum memory is independently invented by several people: An Wang invented the magnetic pulse controlling device, the principle upon which magnetic core memory is based.Kenneth Olsen invented vital computer components, best known for "Magnetic Core Memory" Patent No. 3,161,861 and as being the co-founder of Digital Equipment Corporation.Jay Forrester was a pioneer in early digital computer development and invented random-access, coincident-current magnetic storage. 1949 - Jay Forrester conceives the idea of magnetic core memory as it is to become commonly used, with a grid of wires used to address the cores. The first practical form manifests in 1952-53 and renders obsolete previous types of computer memory. 1950 - Ferranti Ltd. completes the first commercial computer with 256 40-bit words of main memory and 16K words of drum memory. Only eight were sold. 1951 - Jay Forrester files a patent for matrix core memory. 1952 - The EDVAC computer is completed with 1024 44-bit words of ultrasonic memory. A core memory module is added to the ENIAC computer. 1955 - An Wang was issued U.S. patent #2,708,722 with 34 claims for magnetic memory core. 1966 - Hewlett-Packard releases their HP2116A real-time computer with 8K of memory. The newly formed Intel starts to sell a semiconductor chip with 2,000 bits of memory. 1968 - USPTO grants patent 3,387,286 to IBM's Robert Dennard for a one-transistor DRAM cell. DRAM stands for Dynamic RAM (Random Access Memory) or Dynamic Random Access Memory. DRAM will become the standard memory chip for personal computers replacing magnetic core memory. 1969 - Intel begins as chip designers and produces a 1 KB RAM chip, the largest memory chip to date. Intel soon switches to being notable designers of computer microprocessors. 1970 - Intel releases the 1103 chip, the first generally available DRAM memory chip. 1971 - Intel releases the 1101 chip, a 256-bit programmable memory, and the 1701 chip, a 256-byte erasable read-only memory (EROM). 1974 - Intel receives a U.S. patent for a "memory system for a multichip digital computer". 1975 - Personal consumer computer Altair released, it uses Intel's 8-bit 8080 processor and includes 1 KB of memory. Later in the same year, Bob Marsh manufactures the first Processor Technology's 4 KB memory boards for the Altair. 1984 - Apple Computers releases the Macintosh personal computer. It is the first computer that came with 128KB of memory. The 1 MB memory chip is developed. Updated: 04/02/2019 by Computer Hope Computer hard drive history Year Event 1837 Charles Babbage first proposed the Analytical Engine, which was the first computer to use punch cards as memory and a way to program the computer. 1932 Gustav Tauschek developed drum memory in 1932. 1942 John Atanasoff successfully tested the ABC (Atanasoff-Berry Computer) which was the first computer to use regenerative capacitor drum memory. 1946 Freddie Williams applied for a patent on his CRT (cathode-ray tube) storing device on December 11, 1946. The device later became known as the Williams tube or, more appropriately, the Williams-Kilburn tube. The tube stored only stored 128 40-bit words and was the first practical form of random-access memory. 1946 Jan Rajchman began his work on developing the Selectron tube that was capable of storing 256 bits. Because of the popularity of magnetic core memory at the time, the Selectron tube was never put into mass production. 1947 Freddie Williams memory system known as the Williams-Kilburn tube was in working order in 1947. 1947 Frederick Viehe filed several of the first patents relating to magnetic-core memory. Others who helped with the development of magnetic-core memory and magnetic drum memory include An Wang, Ken Olsen and Jay Forrester. 1949 Jay Forrester and other researchers came up with the idea of using magnetic-core memory in the Whirlwind computer in 1949. 1950 The United States government received the UNIVAC 1101 or ERA 1101. This computer was considered to be the first computer that was capable of storing and running a program from memory. 1951 Jay Forrester applied for a patent for magnetic-core memory, an early type of random access memory (RAM) on May 11, 1951. 1952 In his master's thesis, Dudley Allen Buck described Ferroelectric RAM (FeRAM) that was not developed until the 1980s and early 1990s. 1953 In July 1953 a core memory expansion was added to the ENIAC. 1955 Konrad Zuse completed the Z22, the seventh computer model and the first computer that used magnetic storage memory. 1955 MIT introduced the Whirlwind machine on March 8, 1955, a revolutionary computer that was the first digital computer with magnetic core RAM. 1955 An Wang was issued U.S. patent #2,708,722 on May 17, 1955, for the invention of the magnetic "Pulse Transfer Controlling Device," which made magnetic core memory a reality. 1955 Bell Labs introduced its first transistor computer. Transistors are faster, smaller, and create less heat than traditional vacuum tubes, making these computers more reliable and efficient. 1964 John Schmidt designed a 64-bit MOS p-channel Static RAM while at Fairchild in 1964. 1964 Kenneth Olsen was issued U.S. patent #3,161,861 on December 15, 1964, for magnetic core memory. 1968 On June 4, 1968, Dr. Robert Dennard at the IBM T.J. Watson Research center was granted U.S. patent #3,387,286 describing a one-transistor DRAM cell. DRAM will later replace magnetic core memory in computers. 1969 Charles Sie published a dissertation at Iowa State University where he described and demonstrated Phase-change memory (PRAM). Although PRAM has still never been commercially practical, it was still being developed at companies like Samsung. 1969 Intel released its first product, the 3101 Schottky TTL bipolar 64-bit static random-access memory (SRAM). In the same year, Intel released the 3301 Schottky bipolar 1024-bit read-only memory (ROM). 1970 Intel released its first commercially available DRAM, the Intel 1103, in October 1970. It was capable of storing 1024 bits or 1 kb of memory. 1971 While at Intel, Doug Frohman invented and patented (#3,660,819) the EPROM in 1971. 1974 While at Intel, Federico Faggin was granted patent #3,821,715 on June 28, 1974, that describes a memory system for a multichip digital computer. 1978 George Perlegos with Intel developed the Intel 2816, the first EEPROM in 1978. 1983 Wang Laboratories created the single in-line memory module (SIMM) in 1983. 1984 Fujio Masuoka invented flash memory in 1984. 1993 Samsung introduced the KM48SL2000 synchronous DRAM (SDRAM) and quickly became an industry standard in 1993. 1996 DDR SDRAM began being sold in 1996. 1999 RDRAM became available for computers in 1999. 2003 DDR2 SDRAM began being sold in 2003. 2003 XDR DRAM began being sold in 2003. 2007 DDR3 SDRAM began being sold in June 2007. 2014 DDR4 SDRAM began being sold in September 2014.

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