

## Computer Memory History Timeline by Jeff Drobman (C) 2015

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1889 - Punch cards - Herman Hollerith (of IBM forerunner) invented "IBM" punch cards to be used for the 1890 census.

1932 - Drum memory

1947 - Delay line memory

1949 - Magnetic CORE memory

1950 - Magnetic TAPE memory

1955 - Magnetic DISK memory - IBM RAMAC was first one

1957 - Plated wire memory

1962 - Thin film memory

1968 (ca) - Paper tape - Had beginnings dating back to 1846, but became widely used with teletype machines such as the Teletype Model 33 ASR, which were adopted early on by minicomputers as a primitive terminal.

1970 - Bubble memory

1970 - DRAM - Invented by Intel, first device was the 1101, organized as 256x1, followed by the 4x larger (1024x1) 1103(A) -- regarded as the world's first commercial DRAM (intro in October 1970).

1971 - Bipolar SRAM - Fairchild 256x1 (note IBM made a 16-bit SRAM in late 1960s. AMD made a second source of a 64x1 SRAM by Fairchild in 1971.)

1971 - EPROM - Invented by Dov Frohman of Intel as the i1702, a 2K-bit (256x8) EPROM.

1971 - "Floppy" disks -- First were 8-inch, hence very flexible ("floppy"). The 8" became commercially available in 1971.

1973 (ca) - Magnetic TAPE CASSETTE memory

1976 - Shugart Associates introduced the first 5¼-inch floppy (flexible) disk drive

1977 - EEPROM - invented by Eli Harari at Hughes - a BYTE erasable device

1979 - CMOS SRAM (static RAM, 4T/6T cell, implemented as a latch) - first introduced by HP then its spinoff as Integrated Device Technology. I believe first devices were 1K (1024x1), and later organized as x4 then x8.

1983 - 3½-inch "floppy" disk, now rigid body, so called "diskette" - IBM started using the 720 KB double density 3½-inch microfloppy disk on its convertible laptop computer in 1986 and the 1.44 MB high density version with the PS/2 line in 1987. This last bastion of the "floppy" disk all but disappeared by 2007, replaced by hard disks and CD-ROMs. (In January 2007, PC World stated that only 2% of the computers they sold contained built-in floppy disk drives.)

1984 - Flash EEPROM - introduced by Toshiba - first BLOCK erasable device

1984 - Dual-sided 5¼-inch floppy disk - IBM introduced the 1.2 MB version along with its AT model

## PC

1987 - 3½-inch "HD" -- high density diskette (1.44MB).

1995 - DVD - many years of battles over standards delayed the effective use on PCs. there are still several formats, with capacities ranging from 1.5 GB to 16 GB.

1998 - CD-ROM - Apple introduced the iMac in 1998 with a CD-ROM drive but no floppy drive. R/W CDs were introduced next, but only for one-time storage.

1999 - USB Flash drives ("Thumb drives") - co-invented separately by Israeli M-Systems and IBM; introduced commercially in 2000, they now have capacities of 8 GB to 1 TB.

Since 2000 - Flash disks -- natural progression of Flash EEPROM into a large capacity memory module with operational characteristics (speed, density) and cost that competes with and is better than disk drives.

PCs and Macs have been available with flash drives instead of hard drives since about 2006.