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# Remembering WarGames and the IMSAI 8080

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Launched in 1975, the IMSAI 8080 was an early microcomputer built around Intel's 8080 (http://en.wikipedia.org/wiki/Intel_8080) and 8085 (http://en.wikipedia.org/wiki/Intel_8085) microprocessors.

According to Wikipedia (http://en.wikipedia.org/wiki/IMSAI_8080), memory options included 256/4K bytes on a 4K board (static), along with 16K, 32K and 64K DRAM configurations. In terms of storage, the IMSAI supported a cassette drive, floppy disks (5 ¼ & 8″) and hard drives (CDC Hawk-5 MB fixed, 5 MB removable).

🖼imsai8080 (http://www.rambusblog.com/wp-content/uploads/2014/12/imsai8080.jpg)

*Image Credit: Wikipedia*

Running a highly modified version of the CP/M OS known as IMDOS, the IMSAI 8080 was catapulted into the spotlight by its appearance in WarGames (http://en.wikipedia.org/wiki/WarGames), an early hacker film starring Matthew Broderick (David Lightman) and Ally Sheedy (Jennifer Mack).

For the uninitiated, WarGames depicts the fictional story of David Lightman, a high school hacker who unintentionally accesses WOPR, a military supercomputer operated by the U.S. Department of Defense.

[youtube http://www.youtube.com/watch?v=hbqMuvnx5MU]

Believing he is playing an unreleased computer game, Lightman and Mack run a nuclear war simulation (Global Thermonuclear War) on WOPR, prompting a missile scare and nearly kicking off World War III.

As *Wired's* (http://archive.wired.com/entertainment/hollywood/magazine/16-08/ff_wargames?currentPage=all) Scott Brown points out, WarGames has essentially "written itself" into the cult lore of Silicon Valley. Indeed, Google co-founder Sergey Brin told a packed 2008 symposium in Mountain View that WarGames was a "a key movie of a generation, especially for those of us who got into computing."

Cold war nostalgia aside, the above-mentioned IMSAI DRAM specs highlight just how far memory technology has evolved since 1975.

"If we take the IMSAI's 16K DRAM configuration as a starting point and compare it to the 4-8 GB LPDDR3 packed into Microsoft's Surface Pro 3 tablet (http://www.microsoft.com/surface/en-us/products/surface-pro-3) or the 2GB LPDDR3 RAM on board Apple's iPad Air 2 (http://store.apple.com/us/buy-ipad/ipad-air-2), we are looking at an increase of 41% per year and 36% per year, respectively," said Loren Shalinsky, a Strategic Development Director at

increase of 1% per year and 50% per year, respectively," said Loren Shalinsky, a Strategic Development Director at Rambus.

"This validates Moore's Law (http://en.wikipedia.org/wiki/Moore%27s_law), which observes that the number of transistors in a dense, integrated circuit doubles approximately every two years, or about 41% growth per year. In addition, the power consumption of each DRAM device today is remarkably similar to what it was in 1975, meaning that a typical system today provides around 500 thousand times more memory capacity within a similar power envelope."

As Shalinsky adds, the demand for DRAM has only increased over the years. To be sure, DRAM is fitted into an increasingly wide range of devices including Maker and dev boards, smartphones, tablets, wearables, servers, traditional PCs and laptops.

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