**Acorn – the Beginning**

The year was 1979. Atari introduced a coin-operated version of Asteroids. The programming language ADA was born. 3COM, Oracle, and Seagate were founded. TI entered the computer market. Hayes marketed its first modem, which became the industry standard for modems. The Motorola 68K and Intel 8088 were released. And Hermann Hauser and Chris Curry, with the support of a group of students and researchers from Cambridge University’s many laboratories, set up Acorn Computers to make personal computers in Cambridge, England.

The first product from Acorn was the British home computer, the Atom, with a blazing-fast 1MHz processor and 12kbytes of ROM and RAM. From here, the company went on to work with the British Broadcasting Corporation (BBC) to produce and market a home computer, intended to increase UK computing awareness. The resulting product, the BBC micro, became a smashing success upon its release in 1982.

However, the rest of the computer world was not standing idle. For example, Apple launched the Lisa, which combined the first commercial windowing environment in a PC with a 16-bit processor. This made the folks at Acorn aware that increased performance would be needed beyond the existing 8-bit machines. As a direct result, a team was set up within Acorn’s Advanced Research and Development section, to try and develop a special project for a Reduced Instruction Set Computing (RISC) processor – an idea that was at that time quite revolutionary.

**The Birth of ARM Processors**

The outcome of this research project was the first ARM processor, the Acorn RISC Machine (which was later changed to Advanced RISC Machine). Acorn delivered the first samples in 1985, that yielded working silicon the first time it was fabricated using a 3µm process at VLSI Technology. It bettered the stated design goals while using fewer than 25,000 transistors.

The ARM1 was soon superceded by the ARM2, the first production version of the ARM processor, and quite possibly the simplest RISC processor in the world, at the time, with only 30,000 transistors. The instruction set improved upon that of the ARM1 in order to maximize the performance of systems based around it. It featured a true 32-bit data bus, and a 26-bit address bus, with 16 registers and no on-chip cache. In particular, the Multiply and Multiply and Accumulate instructions were added to facilitate digital signal processing, which was to be used to generate sounds, an important feature of home and educational computers. Despite the additions, the ARM2 still maintained its small die size and low transistor count; it was also manufactured by VLSI, which garnered rights to sell chips using the design.

The first ARM2-based product was the ARM Development System, which included the ARM processor and three support chips, 4 Mb of RAM and a set of development tools with an enhanced version of BBC BASIC.

The second ARM processor-based product was Acorn’s multimedia PC, the Archimedes, released in mid-1987. It featured an 8 MHz version of the ARM2 and three support chips (MEMC, VIDC, and IOC), an input/output controller, and a simple operating system. The Archimedes received a lukewarm response at its launch because personal computing appeared to be consolidating behind the IBM PC standard while Acorn had introduced a computer with a new processor, a new operating system, and no base of software to provide users with the applications they needed. It took two to three years for a credible amount of applications software native to the ARM processor and the Archimedes PC to be developed. After that Acorn refined and improved its computer models to confirm its position as a leader in the British home and educational computing market.

After the launch of the Archimedes, Acorn continued to support its research and development team in creating improved versions of the ARM processor. To expand the design so that it offered the kind of performance expected of a high-end personal computer, a 4 Kbytes on-chip data and instruction cache was added, the clock rate was increased to 25 MHz, and the ARM3 was launched. In 1990, the new processor found a home in Acorn's desktop computers.

**ARM’s First Chip**

Although the ARM processor was developed as a custom device for a highly specific purpose, the team designing it felt that the best way to produce a good custom solution was to produce a processor with good all-round performance. However, it’s interesting to note that the ARM’s architectural fate was sealed accidentally. While most of the RISC processor vendors were designing relatively huge chips (SPARC RISC, Intel i860, AMD 29000, etc.), ARM opted to develop a small-scale processor. One of the reasons the ARM processor was designed as a small-scale solution was that the resources to design it were not sufficient to allow the creation of a large and complex device. While this is now a technical plus for the ARM processor, it began as a necessity for a processor designed by a team of talented, but inexperienced designers (outside of university projects, most team members were programmers and board-level circuit designers) using new tools, some of which were far from state-of-the-art.

Despite the unusal working quarters, the motivation and excitement of the small team was high and the company had an open, communicative style that helped maintain the “buzz”. As with most start-ups, ARM’s primary goal was to get the first product out; in this case, it was the ARM610, designed specifically for Apple. This product included full 32-bit addressing and endianness support, one of many changes requested by Apple in order to use the ARM processor in its planned products. An improved video controller, VIDC20, was also developed as well as a floating-point processor. Apple’s goal was to use the IP product within a hand-held personal organizer processor. The processor became known as ARM600, from which the 20 MHz ARM610 used in the Newton was later derived. At the same time, ARM Ltd.'s software team developed the ARM Cross Development Toolkit, a suite of software that allowed designers working on a range of platforms to use ARM development tools, assembler, compilers, and debugging and emulation programs.

Hardware evaluation kits were also produced to enable designers to test the ARM6 processor and to begin to develop operating system and support software for use with their own designs before the availability of finished systems. ARM Ltd. developed the PIE (Platform Independent Evaluation) Card, which allowed system designers to test their ideas on an ARM processor card attached to a host machine running the Cross Development Toolkit.

emulation – 1) эмуляция выполнение на компьютере программ, написанных для компьютера другого типа. Эмуляция заключается в точной имитации функционирования всех частей одного компьютера на другом. Она может быть выполнена на программном, микропрограммном или аппаратном уровнях. Используется при разработке для новых типов компьютеров, а также для обеспечения исполнения программ (legacy application), написанных для уже снятых с производства компьютеров