

A Trip Through History

On location at the historical study-collection of the faculty of EEMCS

In February, the foundation behind the historic study collection of the faculty of EEMCS, Ampère, celebrated the 40th anniversary of the faculty's historic collection. Over these 40 years, the collection has steadily grown to the impressively diverse collection it is today. We've paid the foundation a visit and are very excited to share some stories behind the historical devices present in their collection.

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About Ampère

Martin Beusekamp is one of the volunteers helping out with maintaining and extending the historic collection. He guides us through the various rooms on the 5th floor of the Carré building, which houses the collection. Together with the other volunteers, Martin contributes to the preservation of historically relevant (mostly measurement) devices that are related to academic work done in the areas of Electrical Engineering, Computer Science and Mathematics. Ampère was founded in 2007 to professionalize the preservation of the historic collection. The association is independent of the University of Twente which allows them to acquire funding in order to maintain the collection. Next to acquiring devices to extend the collection, time is also invested in getting to know the devices by performing tests and collecting manuals.

Nowadays manuals can easily be found on the internet. Back in the early days of the University of Twente, these manuals were only published on paper, so the association also tries to collect and digitalize these manuals. In addition, there is a large collection of year reports by several companies that published technological innovations on paper every year, such as Philips.

Over the last 50 years, a lot of different components have been used in electronic devices. Present in the historic collection are capacitors of all different types and size, and devices such as vacuum tubes and transistors and many, many more. Together with the rest of the collection they are maintained to preserve the heritage of the faculty of EEMCS.

Next, let us show some exciting and/or surprising devices from their collection.



Philips DC Voltage Supply PE 4804 (1966)

Martin: 'This DC supply unit is one of the power supplies present in the historical collection. Built back in 1966, it was originally used at Hollandse Signaalapparaten in Hengelo, this company later became Thales Hengelo. What makes this device so special is that no silicon transistors have been used in its design. For the past half century we have designed circuits predominantly using silicon devices, but just before silicon became the workhorse of electronic circuits, there was a short period in which devices were designed using germanium transistors and selenium rectifiers, this power supply originates from this period.

And it works! Not all devices in our collection are still operational, but some are. Unfortunately, we lack the time to thoroughly test each device, so we can-

not determine for each device if it still works and if not, what exactly is broken. Transistors and ICs in a plastic encapsulation are vulnerable to moisture diffusing through the plastic. The moisture could be diffused out again by turning the device on and leaving it on for a few hours, but we don't want to put the devices on time clocks. And if we would, the UT wouldn't, and if the UT would, the fire brigade wouldn't want us to do so.'

Next to the DC supplies, the collection also houses some high-frequency devices that have been used in the past. The collection of oscilloscopes is very diverse consisting of all kinds of different devices, such as an oscilloscope that has removable plug-in units to change its functionality.

Vacuum Tube Collection

In addition to the measurement devices, also a lot of historic components have been acquired in Ampère's collection. The picture below shows some old-fashioned vacuum tubes that used to be present in electronic devices back in the days. The historic decrease in component size cannot only be seen in the collection of vacuum tubes, but also in the collection of transistors, capacitors and ICs.





Intel Corporation
8755 Universal PROM
Programmer (1975)

Martin: 'In our computer collection, we keep many historical models of personal computers and accessories. Since the computer has been among us almost just as long as we have been working with these devices, our collection on this front is quite extensive. One of these devices is this historic PROM programmer. PROM stands for programmable read-only memory, which can be programmed only once (then it is fixed). Using the Zero-Insertion Force sockets in the front, the user could programme the device.'

We found that the manual also nicely describes this very innovative technique to easily insert new code into the ma-

chine:

"On the front panel of the Universal PROM Programmer are mounted two zero-insertion-force sockets one 16-pin, the other 24-pin (UPP-IOL). Each socket is driven by a printed circuit board within the PROM Programmer that contains the electronic circuits required to program a particular class of PROMs. These printed circuit boards with the device-related circuitry are referred to as "personality cards". The Universal PROM Programmer can contain two different types of personality cards at any given time (one associated with each socket). The personality cards are easily exchanged to allow users to reconfigure their UPP, as required to program the PROM devices."

Gandalf Modem
(1970)

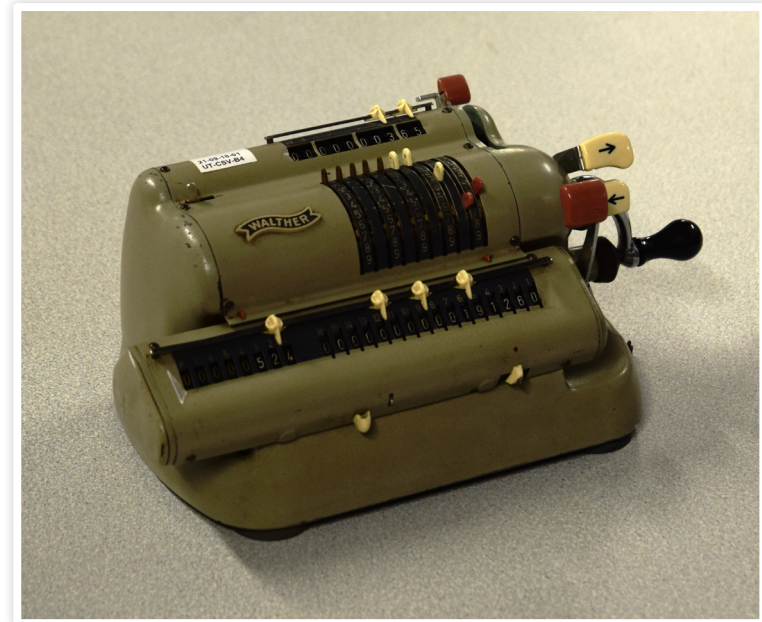
The Gandalf modem is the historical version of the remote-desktop protocol that we that we nowadays often use at Scintilla.

Martin: 'It acts as a communication device to a central computer that does the calculations. In the current Cubicus building, this central computer used to be present. On your desk you only have a keyboard and display, the Gandalf modem then communicates to the central computer over the telephone line.'



Walther RMKZ
(between 1931 and
1952)

Martin: 'Our historical collection of calculators contains several categories. We have some purely mechanical calculators, some electromechanical in which a motor did the work and several purely electronic pocket calculators. This Walther model is one of the mechanical calculators, you can enter a number and by turning the handle several times you can change the number it should multiply with and the result will show up. Turning the other way around yielded the result of the division operation and there were also all kinds of tricks to take the square root.'



Laser Disks

Nearing the end of the visit, we discussed the predecessor of the CD and DVD media: the laser disk. Laser disks are analogue media that store video audiovisual content on a disk. The processing is done entirely analogue based on information on the brightness and co-

lour stored on the disk. This also means that the smallest mistake present on the device yields an error in the footage. For interactive use the discs contained one image per rotation. Reading out frame numbers, clever programmes could then be made that allowed for random ac-

cess to all stills and video footage on the disk. In this mode every side of the disk could store 36 minutes of footage. For feature films the discs could be recorded in a way that both sides of the disc contained one hour of material. This allowed for some of the first interactive courses used in industry and education. The laser disks were later replaced by more advanced ways to show footage, such as the DVD.



Has your interest been sparked by this article, and would you like to know more about the historic collection? On the website of the historic collection, many, many more information on historic devices can be found: studieverzameling.utwente.nl.

Feel free to contact the people maintaining the collection with any further questions at studieverzameling@utwente.nl.