

# A Few Calculators

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Through at least the 1960s most professional chemists and students of chemistry performed routine chemical calculations using a slide rule, of which the Oesper Collections own a fairly representative sample. However, starting in the 1930s, chemists specializing in theoretical and physical chemistry often required the use of more elaborate desk calculators of which the Oesper Collections also own a small, but representative, sample (1).

The earliest of these were necessarily mechanical in nature and are illustrated by the examples in figures 1 and 2. The first of these shows a circa 1920 German-made, hand-cranked, “Hannovera” mechanical pin-



Figure 1. A circa 1920 German-made “Hannovera” hand-cranked mechanical calculator and its wooden storage case.

wheel calculator with its wooden storage case, whereas the second shows a circa 1930 American-made, hand-cranked, “Comptometer” mechanical calculator. This latter instrument was first patented in 1887, though the model shown in figure 2 probably dates from the 1930s.

In both instruments the answers were displayed via numbers on a mechanical rotor that would appear in a series of small openings on the face of the machine. In the 1940s calculators began to appear in which the turning of the gears necessary to compute



Figure 2. A circa 1930 American-made “Comptometer” hand-cranked mechanical calculator.



Figure 3. A circa 1971 electronic “Compucorp” calculator using a Nixie tube display. An example array of Nixie tubes is shown in the foreground.



Figure 4. A circa mid-1970s portable electronic calculator with a LED display marketed by Sears under the logo “Electronic Slide Rule.”

the final answer was performed by a small electrical motor rather than a hand-crank and which printed both the input and final answer on a roll of paper. Though “electrical,” such machines were not “electronic” in the true sense of the word, because the calculations were still performed by mechanical means. In recognition of this, they are sometimes referred to as “electro-mechanical” calculators.

While large-scale computers using vacuum tube technology date from the 1940s, small desk-top and personal electronic calculators only became possible with the widespread adoption of solid-state electronics. Even then their size was limited by the displays. Thus the circa 1971 electronic “Compucorp” calculator in figure 3 used a “Nixie tube” display consisting of eight small vacuum tubes, each containing ten filaments, with each filament in the shape of a number between 0 and 9.

By the mid- to late-1970s the calculator had shrunk



Figure 5. A more sophisticated, circa late-1970s, portable electronic calculator with a LED display.

once more, this time due to the introduction of displays using light emitting diodes (LEDs). As shown in figures 4 and 5, the end result was our present-day, hand-held, personal calculator. Finally, in the 1980s LED displays were displaced by liquid crystal displays, though without any further significant decrease in size, and this has continued to be the presently preferred mode of display.

The calculators shown in this installment of *Museum Notes* may be seen on display in the cabinets on the wall outside of the entrance to the Oesper Collections in Room 529 of Rieveschl Hall.

### References and Notes

1. For a much larger display of desktop and handheld calculators, as well as their history, see the website “Vintage Calculators Web Museum” at <http://www.vintagecalculators.com/>