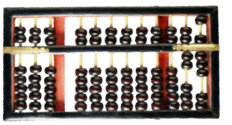
Calculator

The Calculator

Today's calculators have changed a lot in comparison to their ancestors. Ancient calculating devices were analog in function and required physical motion on the user's part. The first calculating device was the slide rule, which consists of scales that can be slid along one another to do calculations. From this point onward, calculators were at the forefront of technology progression. Today, they have become a refined device known for these features: portability, small size, replaceable batteries, increased functions, liquid crystal display, solar power, and their low cost.

The Abacus



In ancient times the abacus was the main aid to calculation. In contrast to the electronic calculator it does not actually do the computing. It helps people keep track of numbers as they do the computing. People who are good at using an abacus can often do calculations as quickly as a person who is doing them on a calculator. Physically it looks like a wooden frame with a cross-beam. Rods or wires carrying sliding beads extend vertically through the crossbeam. Although different versions vary in how many beads are placed above or below the crossbeam, they all perform the same basic function.

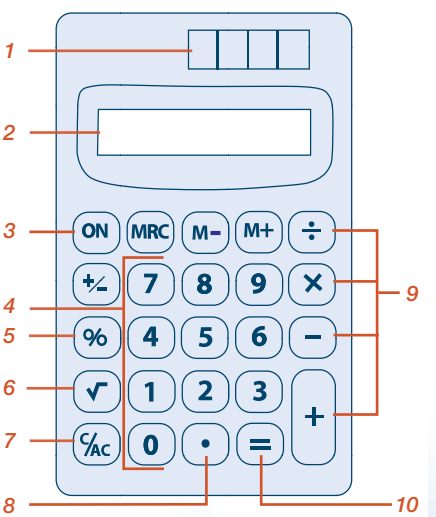
Today's Calculators

Calculators have come a long way from the original functions they were capable of. In fact, the more complex scientific calculators at this time support trigonometric, statistical and other mathematical functions. The most advanced modern calculators can display graphics, and feature computer algebra systems. They are also programmable; calculator applications include algebraic equation solvers, financial models, and even games.

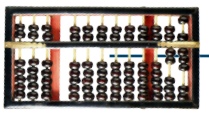
Since the late1980s, it has become common to incorporate simple calculators in other small electronic devices, such as mobile phones, pagers, palm pilots, or wrist watches.

A Basic Calculator

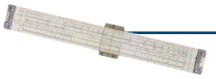
1 Power Source	Such as a battery or solar panel.
2 Display	Usually made from LED lights or liquid crystal (LCD), and can show up to 10 digits.
3 On	Turns calculator on.
4 Keypad	Contains the numbers from zero to nine.
5 Percentage	To express the number as a fraction of 100.
6 Square Root	To get the root of a number.
7 Cancel Button	To clear current calculation.
8 Decimal Point	Used to mark boundary between integral and fractional parts of a decimal numeral.
9 Arithmetic Functions	Include division, multiplication, subtraction and addition.
10 Equals Sign	To prompt for current answer.



Timeline



Ancient times — The abacus is the main aid to calculation.



1622 — William Oughtred invents the slide rule

1623 — Willhelm Schickard invents the first mechanical calculator

1872 — Frank Baldwin of the United States creates the pin-wheel calculator.

1884 — Dorr E. Felt invents the Comptometer, the first successful key driven adding and calculating machine.

1990-1975 — Typical electrically driven, stepped-gear calculator with automatic multiplication and division.

1961 — First electronic desktop calculators. They used vacuum tubes.

1963-1964 — First commercial transistorised desktop calculators.

1969 — Battery powered, hand held, electronic calculators emerge.

1970 — With invention of calculator on a chip, the first pocket sized electronic calculator can be made.

1971 — First calculator to use a microprocessor (the Intel 4004).

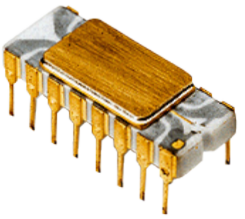
1972 — First scientific pocket calculator introduced.

1978 — First solar powered calculator introduced.

Intel 4004

A very important link in the evolutionary chain of calculators was the invention of the world's first commercial single-chip microprocessor. In the late 1960s Intel Corporation took a contract from Busicom of Japan to produce a series of integrated circuits for the varying specifications of a new range of calculators. They decided instead to produce one general purpose processing unit, the Intel 4004, the first commercially successful microprocessor. This chip allowed calculators to continue shrinking in size while growing in the functions they possesed.

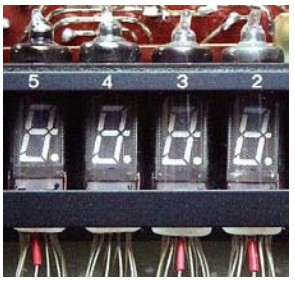
What is equally impressive is that although originally designed to be a component



in Intel calculator products, the 4004 soon found many uses as a flexible replacement for collections of simple logic chips in a variety of applications, thus indicating that there existed an untapped market for microprocessors as such. This prompted Intel and some other integrated circuit manufacturers to develop steadily more capable microprocessors; a trend that eventually created the multibillion-dollar microprocessor and microcomputer industries of today (Tout).

Display technology

The technology that was available during the evolution of the calculator determined how and what color the digits were represented on the calculator's display. These digits evolved through a variety of colors and based on these colors you can determine the technology that was used at the time the calculator was made (Tout).



If the digits glow	
Intense red	Light Emitting Diodes (LED).
Delicate amber	Gas Discharge (Nixie, Panaplex).
White	Filament lamp/"Light-Pipe".
Bright green	Vacuum Fluorescent (VFD).
Bright blue	Vacuum Fluorescent (VFD).
If the digits do not glow	Liquid Crystal Display (LCD)

Sources

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Photo Sources:

All photos have been taken from vintage-calculators.org

Digital–Analog Design Punch Cards is a set of research cards designed and produced by the students of DSGD 186, Digital Applications Methodology, a third-year graphic design course at San Jose State University, Fall 2006. The set, composed of 1+26 cards, is by no means complete. Each topic was chosen and researched by the students, based on a theme presented by the instructor Pino Trogu, with help from Mauro Panzeri. This is card number 02 and it was designed by **Jenna Nybank**

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