

# Calcolatori personali: strumenti di produttività personale

Storia dell'Informatica  
a.a. 2022/23

- L'informatica, personalmente
- Strumenti personali, Galileo in affari
- Regoli e calcolatrici cui affezionarsi
- Precursori, di nuovo
- Primi tentativi di pubblici altri

## □ Hardware

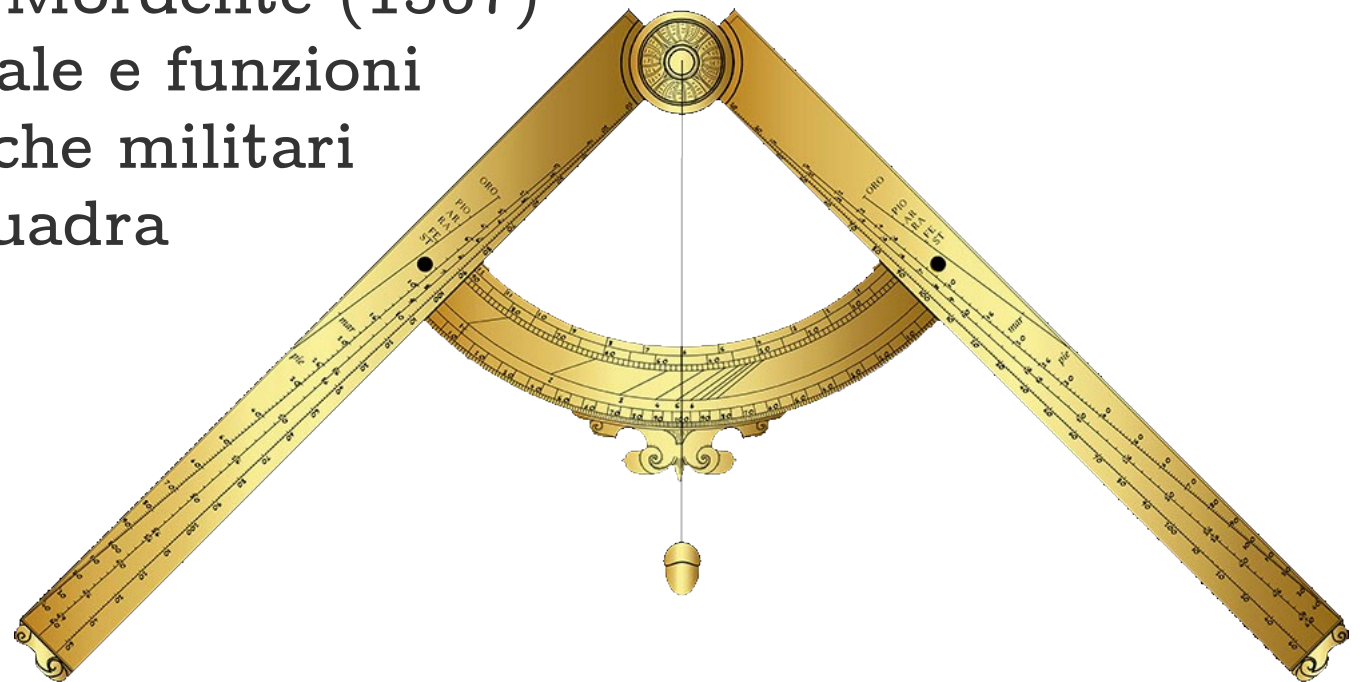
- Sempre più portatili, sempre più propri
- Smartphone, tablet, con custodie e accessori
- Notebook, per chi lavora, sempre e ovunque :(
- Il desktop (tower): vecchi uffici o smanettoni

## □ Software e servizi

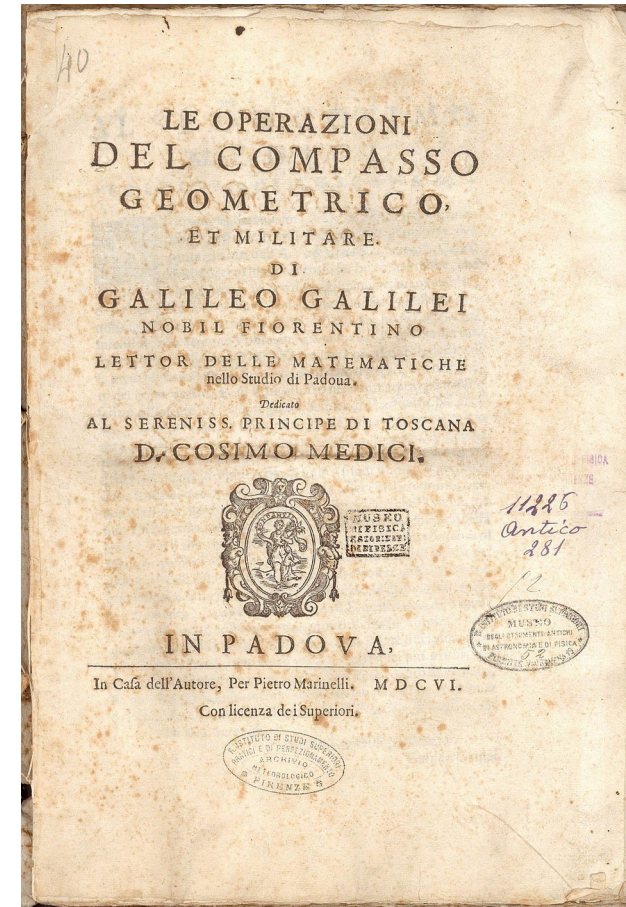
- Facebook, Twitter, Instagram... i selfie!
- Le *app*, come personal assistant
- Produttività personale, ieri suite da ufficio
- I videogiochi, almeno lì rimane la sfida tecnologica

## □ Un tempo più “seri”, comunque personali

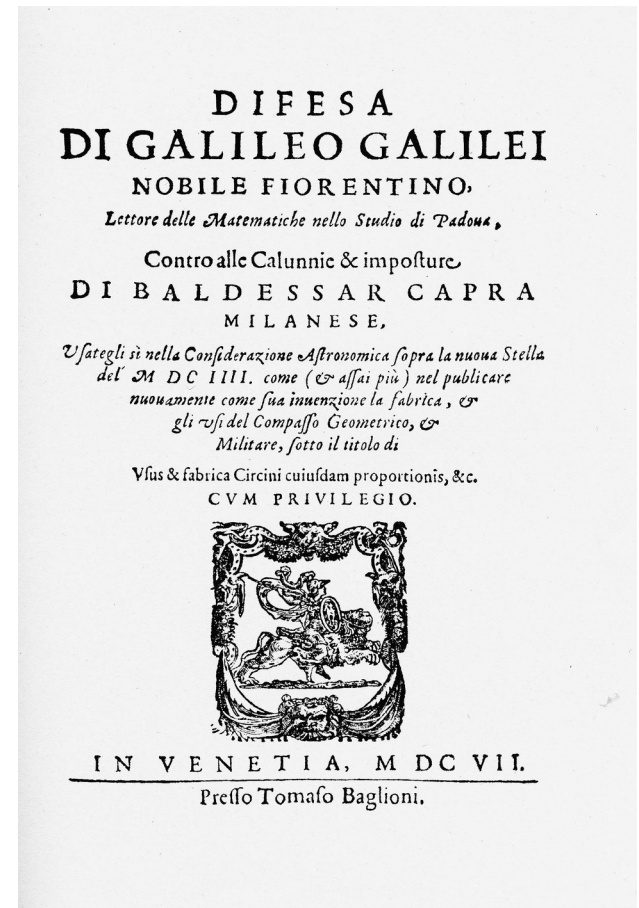
- Il coltellino svizzero del calcolo (1597)
  - Compassi calcolatori già ben noti
  - Compasso di Mordente (1567)
  - Unisce più scale e funzioni
  - Usi sia civili che militari
  - Sestante e squadra
  - Goniometro



- A Padova, 1592-1610
  - Dopo la morte del padre (1591)
  - Imprenditore per necessità
- La bottega
  - Con Marcantonio Mazzoleni
  - Costruzione su commissione
- Il manuale
  - Solo d'uso
  - Quasi inutile senza compasso
  - Dedicato a Cosimo Medici



- Baldassarre Capra
  - Già in polemica con Galileo sulla “nova stella” di Keplero
  - Plagiò il manuale traducendolo in latino
  
- La risposta di Galileo
  - Capra è sfidato in cimento
  - Di fronte ai Riformatori dello Studio di Padova



... un tavolino da potervi posar sopra un libro, un compasso, un poco di carta, con penna ed inchiostro... finalmente, instandolo io e sfuggendo ogn'altro diverticolo, al preparato tavolino lo condussi...

... a questo si trovò egli più che mai involuppato: e finalmente, per distrigarlo di là ond'ei mai non si averebbe sviluppato, bisognò che io gli dicessi come l'error suo era...

... quelli Illustrissimi ed Eccellentissimi Signori, chiarissimi ormai della verità del fatto, forse compassionando al tormento nel quale io ritenevo il malarrivato Capra, fecero cenno che tanto bastava...  
... domandai ancora al Capra, chiesta buona licenza a quei Signori, quanto fusser grandi gli angoli di un triangolo...



- I regoli, da Napier in poi
  - *Mirifici Logarithmorum Canonis Descriptio*, 1614
  - 1620ca, Edmund Gunter, Oxford, protoregolo circolare
  - 1632, William Oughtred, Cambridge, doppio Gunter
  - 1859, Amédée Mannheim, per l'artiglieria francese
  
- Forme, misure, materiali, specializzazioni
  - Lineari, circolari, cilindrici
  - Da scrivania, ma soprattutto da taschino
  - Legno, legno e celluloidi, bambù...
  - Generici, ingegneria civile, astronomia, aeronautica...





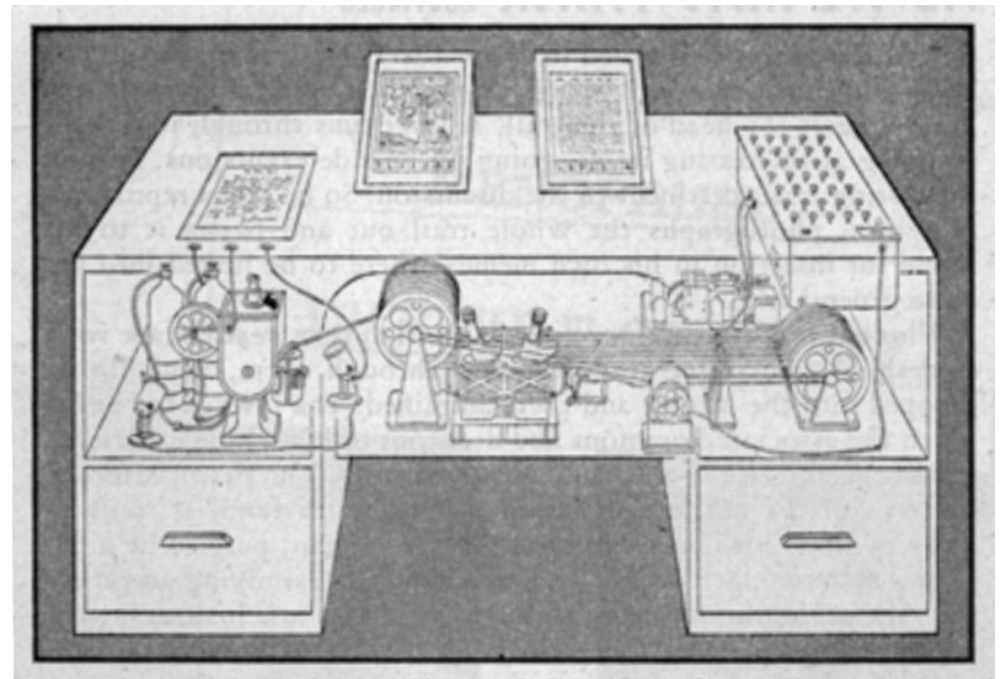
... Well let's see now ah... aa... nn... Radioactive halflife of uh... hmm...  
I would think that uh... possibly uh... one hundred years...

- Una lunga stagione
  - Dalla metà del '800 agli anni '70
  - Produzioni da migliaia a milioni di unità
  
- Sempre professionali
  - Spesso portatili
  - Alcune si aprono e si chiudono
  
- Personali
  - Simili, ma differenti
  - Richiedono impegno, dedizione, anche abilità
  - Ci si affeziona, si difendono



- Dalla calcolatrice al calcolatore
  - Oltre alle operazioni, gestire il procedimento
  - La soluzione meccanica era inadeguata
  - Babbage? forse ce lo dirà Plan 28
  - Zuse? qualcosa con la Z1, ma passò subito ai relé
- La soluzione elettronica
  - Risolve memoria, operazioni, istruzioni
  - È ugualmente veloce su tutti e tre i fronti
  - Non ha parti in movimento
  - Può affrontare calcoli lunghi, e in tempi brevi
- Ma, inizialmente, è ingombrante e costosa

- 1945, “As we may think”, *The Atlantic Monthly*
- Vannevar Bush
  - Ingegnere, gestore di progetti
  - Analizzatori differenziali
  - Spolette con radar di prossimità
  - Manhattan Project





- Ibrido meccanico/elettronico
- Non *stored program*
  - tamburo magnetico per 100 registri
  - schede elettromeccaniche per 128 passi di programma
  - controllo elettronico valvole e diodi
  - unità aritmetico-logica meccanica

## LA COMPUTADORA ELECTRÓNICA E101 DE BURROUGHS



Se "da instrucciones" a la E101 ordenando las clavijas en el tablero móvil.

**¡Tan fácil de operar como una simple calculadora ... computa datos intrincados con rapidez electrónica ... y es pequeña!**

Su tablero de programación elimina el confuso sistema de claves y permite la solución inmediata de sus problemas. ¡Ninguna otra computadora cuesta tan poco! Pida informes al representante Burroughs o escriba a: Compañía Burroughs Mexicana, S. A., Ave. Ejército Nacional 1005, Esquina Presa Oviachic, México 10, D. F.

**Programación simplificada:** el tablero de clavijas permite programar en pocas horas; las plantillas de papel dan registros permanentes que pueden utilizarse de nuevo.  
**Funcionamiento flexible:** La E101 es completamente automática; pero la operadora puede usar su criterio para encontrar las soluciones.

**Unidades opcionales** para la introducción y preparación de cinta perforada; una unidad introduce los datos y otra unidad prepara la cinta perforada.  
La E101 de Burroughs es fácil de instalar, ocupa poco espacio y puede utilizarse inmediatamente.

Hay más E101 en uso que todas las demás computadoras electrónicas combinadas.



**Burroughs**

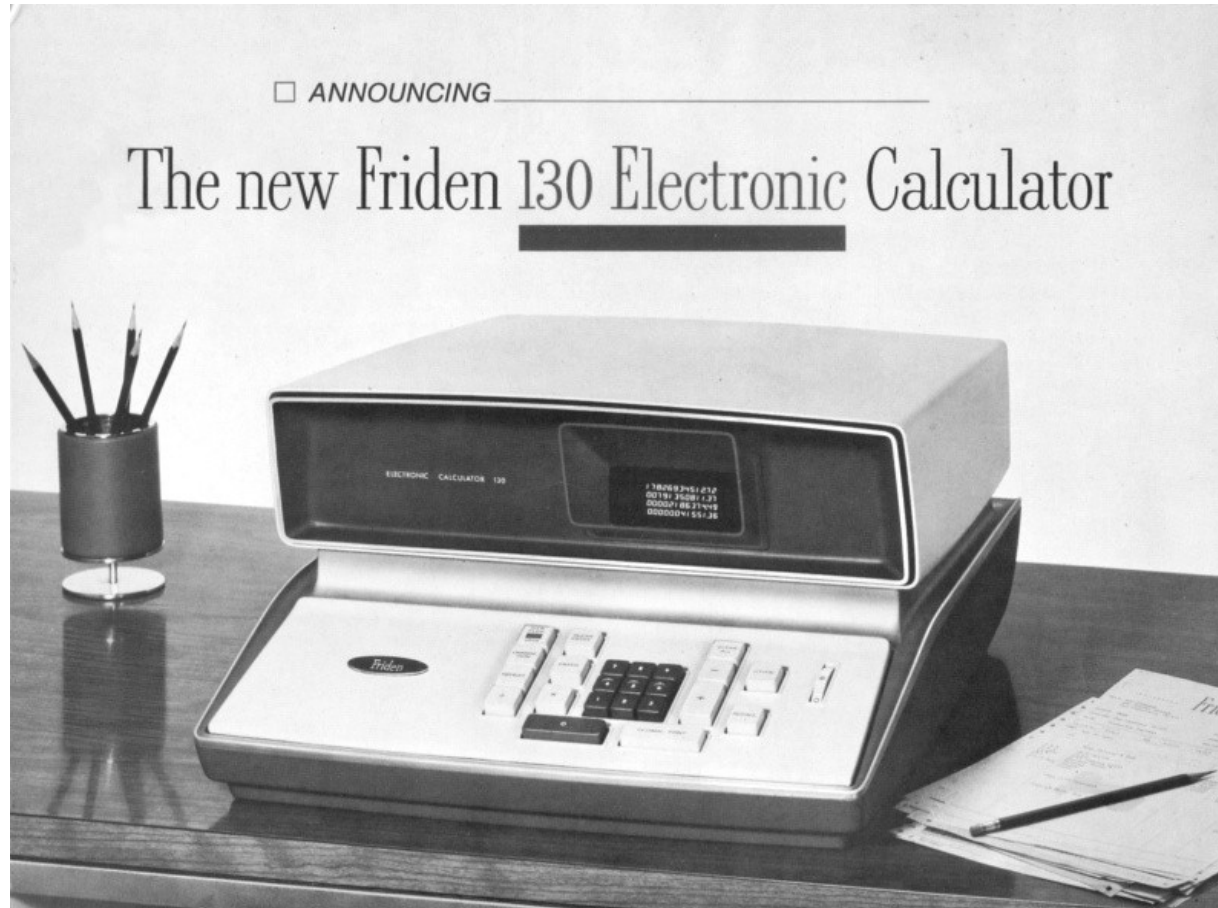
SISTEMAS MECÁNICOS • ELECTRO-MECÁNICOS • ELECTRÓNICOS

## □ Elettronico

- memoria magnetostriativa  
2048 / 4096 parole
- decimale,  
4/24 cifre + segno
- 7 registri dedicati,  
con display
- I/O nastro perforato  
e macchina per scrivere  
alfanumerica







William Kahn  
Roy Reach  
David Shapiro

## how to get a quick tan

Or arctan for that matter. Trigonometric functions are solved in a few seconds on Mathatron, the \$5,000 digital computer.

Mathatron understands algebra — your language. Just tap in the expression the way you would write it. Use power-of-10 exponents, parentheses, square roots, decimal points. Answers from the tape printer are in decimal, with the point in the right place.

Mathatron is expandable, like the big computers. When you need it you can add memory, prewired programs, remote keyboard, paper tape reader/punch, or page printer. But you may prefer to keep yours small. It's a personal thing.

Over 80% of Mathatron owners have access to a big computer, but they prefer quick answers. Write us for the whole story.

**mathatron:** Program memory, 24 to 480 steps • Addressable storage, 4 to 88 registers • 9 significant digits, exponent, and sign • Number range  $\pm 10^{-12}$  to  $10^{99}$  • Speed 100 accumulations per second • Optional prewired programs for special applications.

**MATHATRONICS**  
a division of Barry Wright Corporation

241 Crescent Street, Waltham, Massachusetts 02154, Telephone: 617-893-1630

## ÷ and conquer

Vanquish your problems as they come, with Mathatron, the \$5,000 digital computer. No need to go to number-systems school or build a FORTRAN empire. Just express yourself in algebra on the Mathatron keyboard — use power-of-10 exponents, parentheses, square roots and decimal points.

Mathatron is a programmable, general purpose, electronic companion that saves hours of a professional man's day. Up to 11 pre-wired programs, expandable memory, optional paper tape reader/punch and page printer.

More than 80% of Mathatron owners have access to a big computer, but they would rather get quick answers than fight that battle. Write for the whole story.

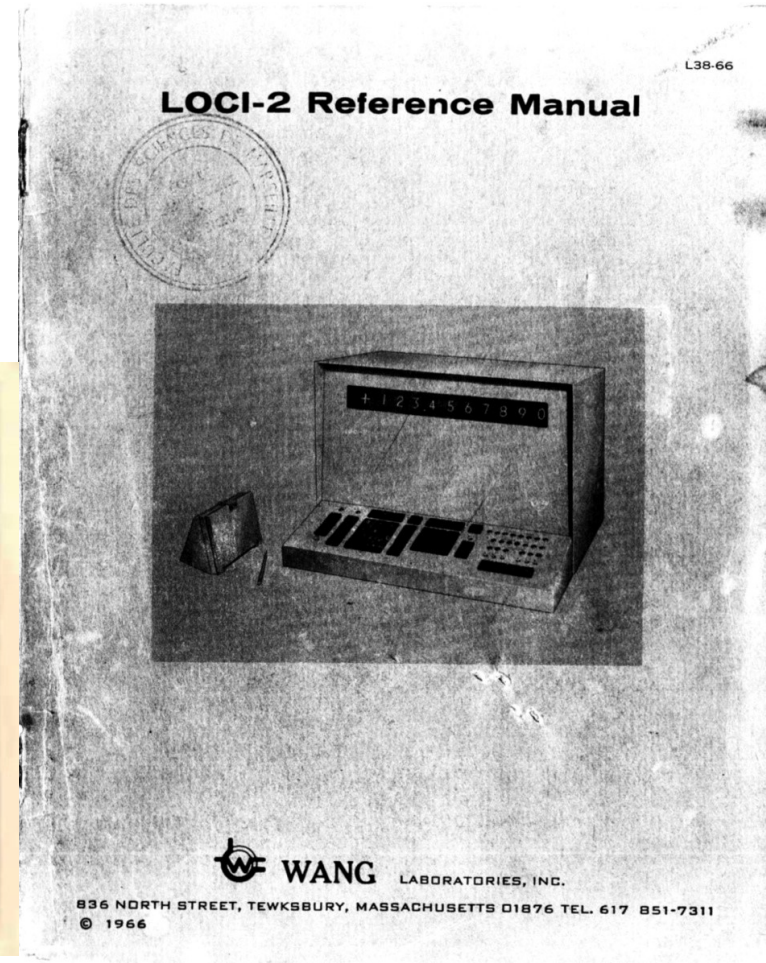
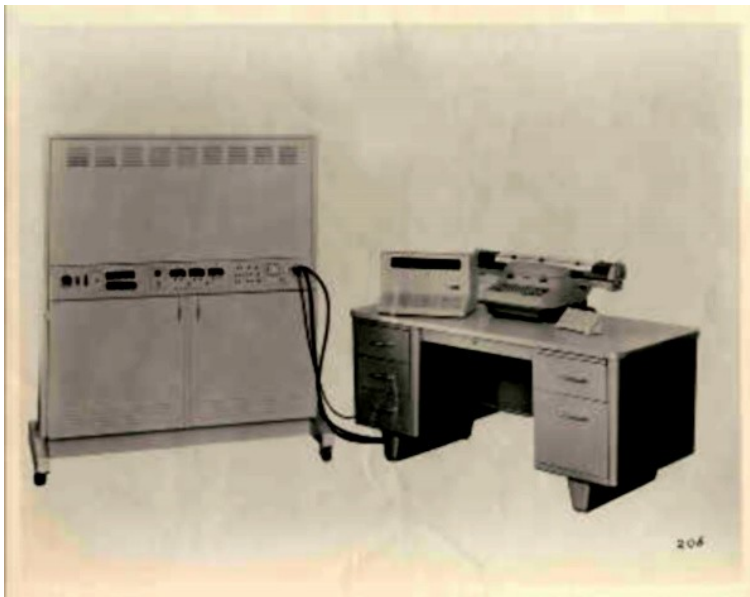
**mathatron:** Program memory (core), 24 to 480 steps • Addressable storage, 4 to 88 registers • 9 significant digits, exponent, and sign • Number range  $\pm 10^{-12}$  to  $10^{99}$  • Speed 100 accumulations per second • Optional prewired programs for special applications.

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# (1964) 1965, Wang LOCI-2

An Wang



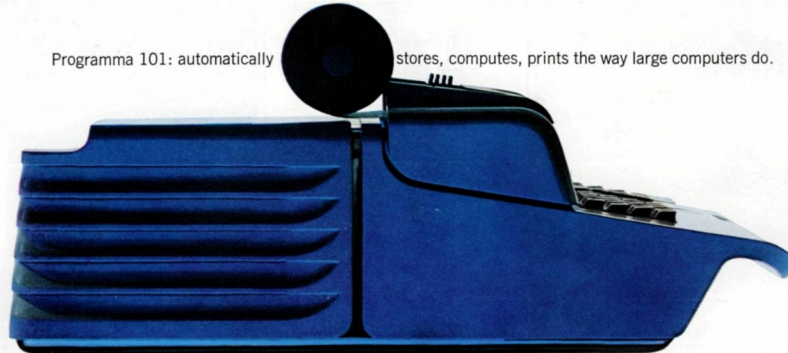


Pier Giorgio Perotto  
Giovanni De Sandre  
Gastone Garzera  
Franco Bretti  
Edoardo Ecclesia  
Mario Bellini (design)

Olivetti  
Underwood  
innovates:  
the world's  
first desk-top  
computer,  
\$3200

This is the world premiere of the Programma 101, the computer that brings a new dimension to business. Now for less than one month's rental of a large computer, businessmen, scientists and technicians can own the Programma 101 outright. Not much bigger than a typewriter, it sits on your desk. Like the large computers, it thinks in milliseconds, makes logical decisions. You can program it to compute logarithms, even print out complex mortgage plans. Automatic printout provides a permanent record. Programs can be stored off the machine on magnetic cards, reentered in seconds. And Olivetti Underwood's program library offers virtually limitless applications. Ask us for a demonstration. Total price, \$3200.

Programma 101: automatically stores, computes, prints the way large computers do.



Massimo Rinaldi



Tom Osborne

## Powerful Computing Genie: \$4900

### READY, WILLING AND ABLE.

**Ready**—to relieve you of waiting to get on the big computer. Constantly available. At your fingertips whenever you need it. Ready to abolish tedium from scientific and engineering computation. Ready to slash through long routines and come up with answers in milliseconds. The new Hewlett-Packard 9100A personal computer.

**Willing**—to perform log and trig functions, even hyperbolic and coordinate transformations, at the touch of a key. Willing to work with extremely large and small numbers simultaneously. Willing to take your programming commands in mathematical language.

No computer language or programming specialist required. Willing to communicate with you on your terms. The new Hewlett-Packard 9100A computing marvel.

**Able**—to take on the most complex problems: roots of a fifth-degree polynomial... solutions to three simultaneous equations... Bessel functions... Fourier analysis... elliptic integrals... real and complex polynomial evaluation... coordinate geometry... regression analysis... numerical integration... vector analysis... and many, many more! Able to be your fast, responsive mathematical servant.



**Dynamic range 10<sup>10</sup> to 10<sup>-10</sup>**—nearly 200 decades. Observation of math operations on 3 displayed registers. Up to 16 more registers for data storage.

**Complex and vector arithmetic**—simplified with coordinate transformation keys, rectangular-to-polar and vice-versa, in milliseconds.

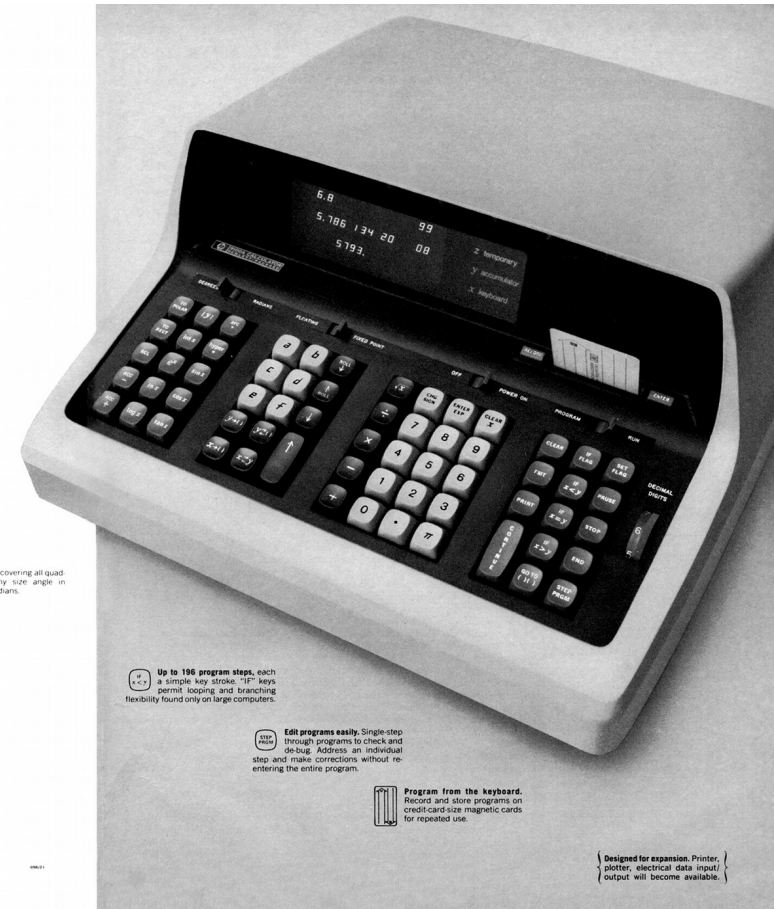
**Trig functions** covering all quadrants and any size angle in degrees or radians.

**Up to 196 program steps**, each a simple key stroke. "IF" keys permit looping and branching flexibility found only on large computers.

**Edit programs easily**. Single-step through programs to check and debug. Address an individual step and make corrections without re-entering the entire program.

**Program from the keyboard**. Record and store programs on credit-card-size magnetic cards for repeated use.

Designed for expansion. Printer, plotter, electrical data input/output will become available.





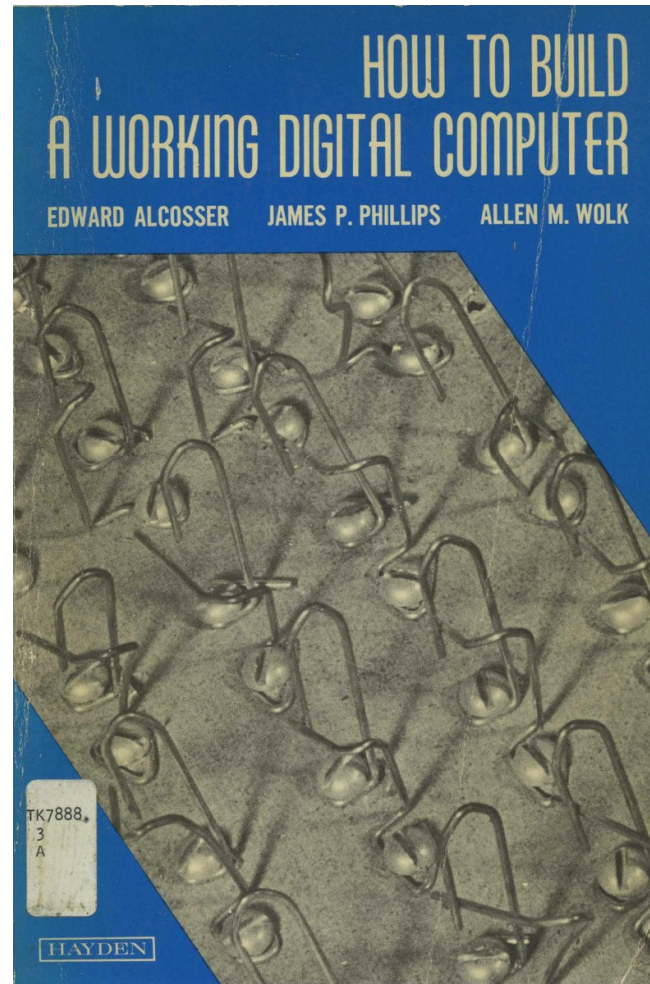
# 1967, Paperclip Computer

Calcolatori didattici,  
o per hobby,  
per tutti (o quasi)

Altri:

1965  
Little Man Computer  
Stuart Madnick  
& John Donovan

1968  
MIX  
Donald Knuth





Gardner Hendrie  
Neiman & Marcus



If she can only cook as well  
as Honeywell can compute.

Her souffles are supreme, her meal planning a challenge? She's what the Honeywell people had in mind when they devised our Kitchen Computer. She'll learn to program it with a cross-reference to her favorite recipes by N-M's own Helen Corbitt. Then by simply pushing a few buttons obtain a complete menu organized around the entrée. And if she pales at reckoning her lunch tab, she can program it to balance the family checkbook. **84A** 10,600.00 complete with two week programming course  
**84B Fed with Corbitt data:** the original Helen Corbitt cookbook with over 1,000 recipes 5.00 (.75) **84C Her Potluck,** 375 of our famed Zodiac restaurant's best kept secret recipes 3.95 (.75) **84D Her labard apron,** one-size, ours a'ore by Garden House in multi-pastel provincial cotton 28.00 (.90) **Trophy Room**



- R.A. Allan, “A History Of The Personal Computer - The People and the Technology”, Allan Publishing Company, 2001.
- G.A. Cignoni, “Dall’Aritmometro al PC”, in Quaderni della Fondazione Galilei, n. 2, 2013