Apparently "Vintage" now means "What I Once Used"

- Part 1: How Vintage Computing Devices Benefitted Me
- Part 2: The Amazing Curta!
- Part 3: Show and Tell

Kerry Veenstra, K3RRY

Timeline

1975
Sears Calc.
$80
$500

1979
HP-29C
$175
$750

1983
Osborne
$1,800
$5,600

1994
HP-200LX
$749
$1,600

1962

1972
Adder
$2.50
$20

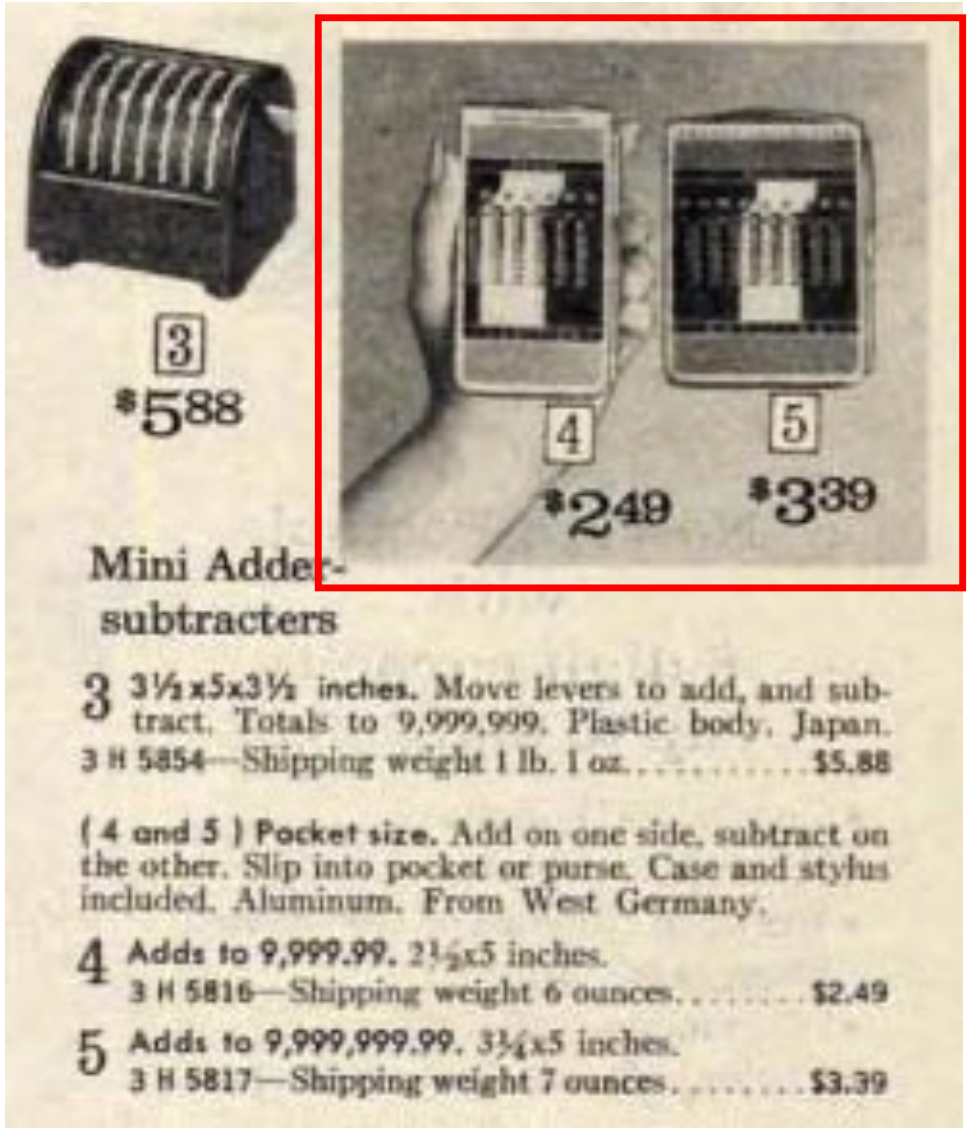
1977
R.S.
$20
$100

1980
HP-41C
$295
$1,100

1983
HP-16C
$125
$390

1990
T1000SE
$1,700
$4,100

Sears Pocket Adder (1972)



3
$5.88

4 $2.49

5 $3.39

Mini Adder-subtracters

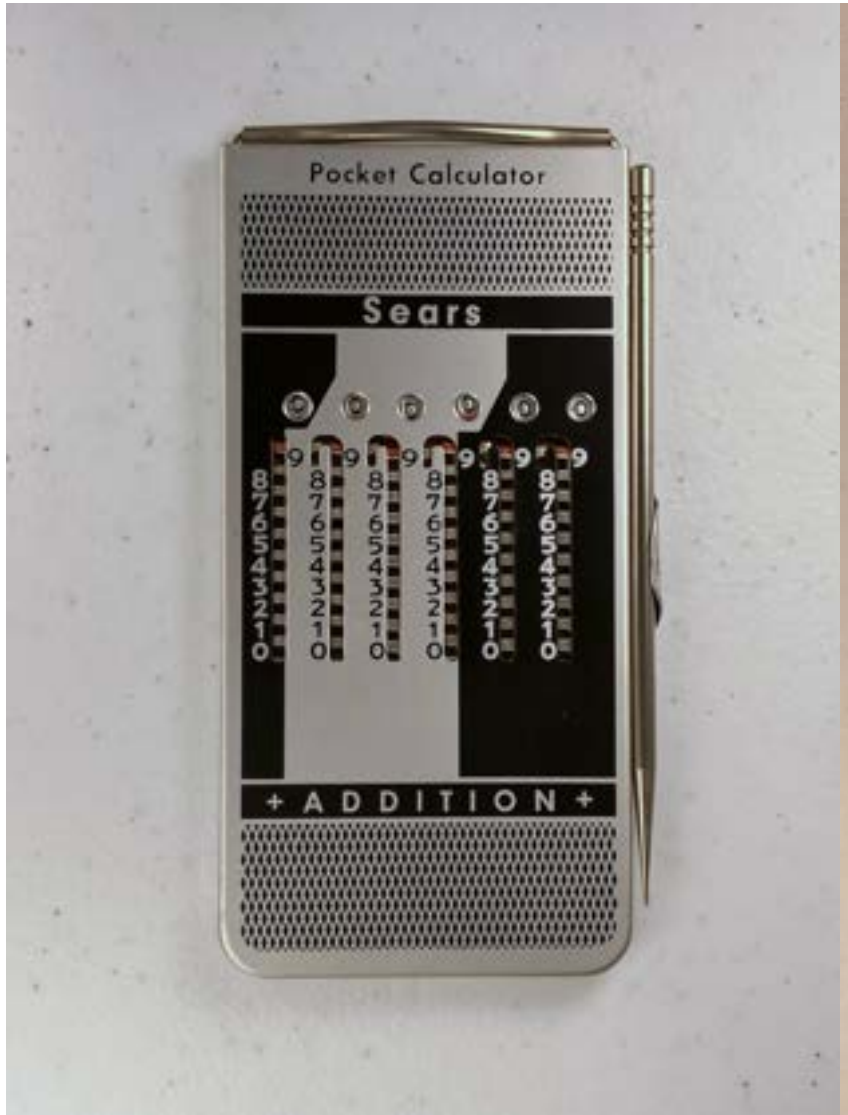
3 **3½x5x3½ inches.** Move levers to add, and subtract. Totals to 9,999,999. Plastic body. Japan.
3 H 5854—Shipping weight 1 lb. 1 oz. $5.88

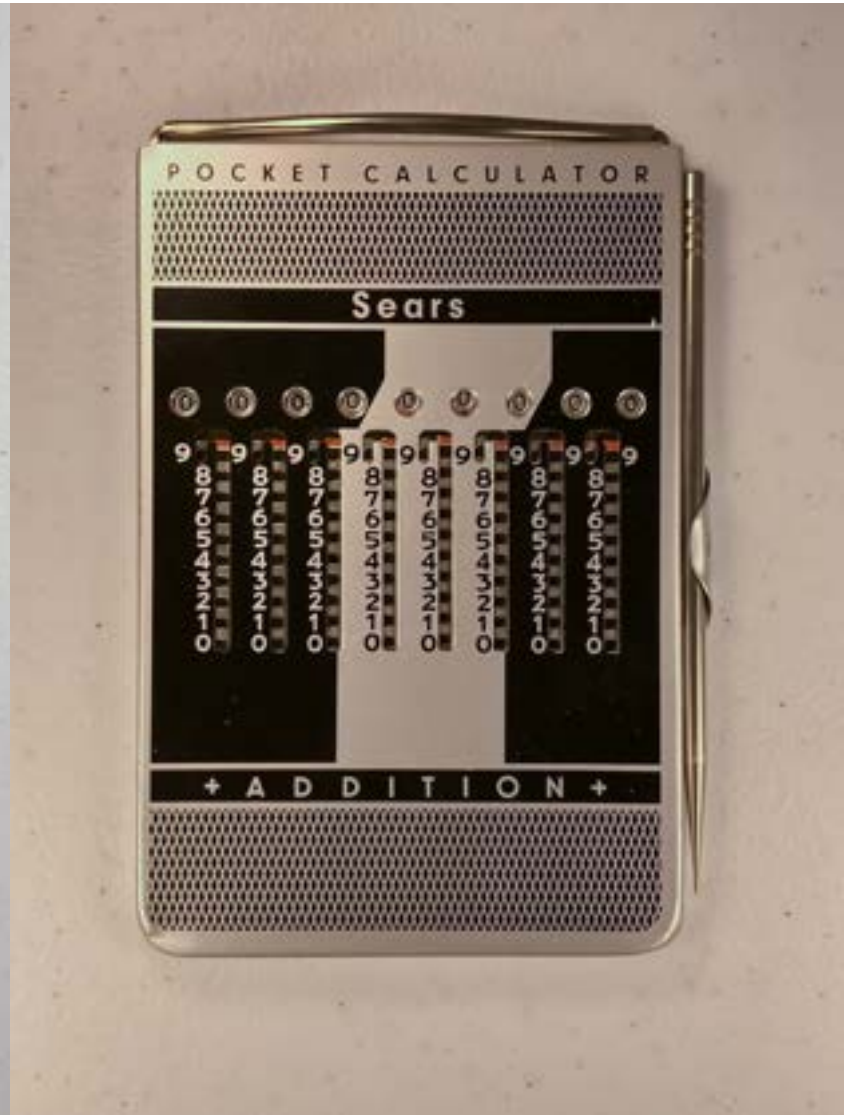
(4 and 5) Pocket size. Add on one side, subtract on the other. Slip into pocket or purse. Case and stylus included. Aluminum. From West Germany.

4 **Adds to 9,999.99.** 2½x5 inches.
3 H 5816—Shipping weight 6 ounces. $2.49

5 **Adds to 9,999,999.99.** 3¼x5 inches.
3 H 5817—Shipping weight 7 ounces. $3.39

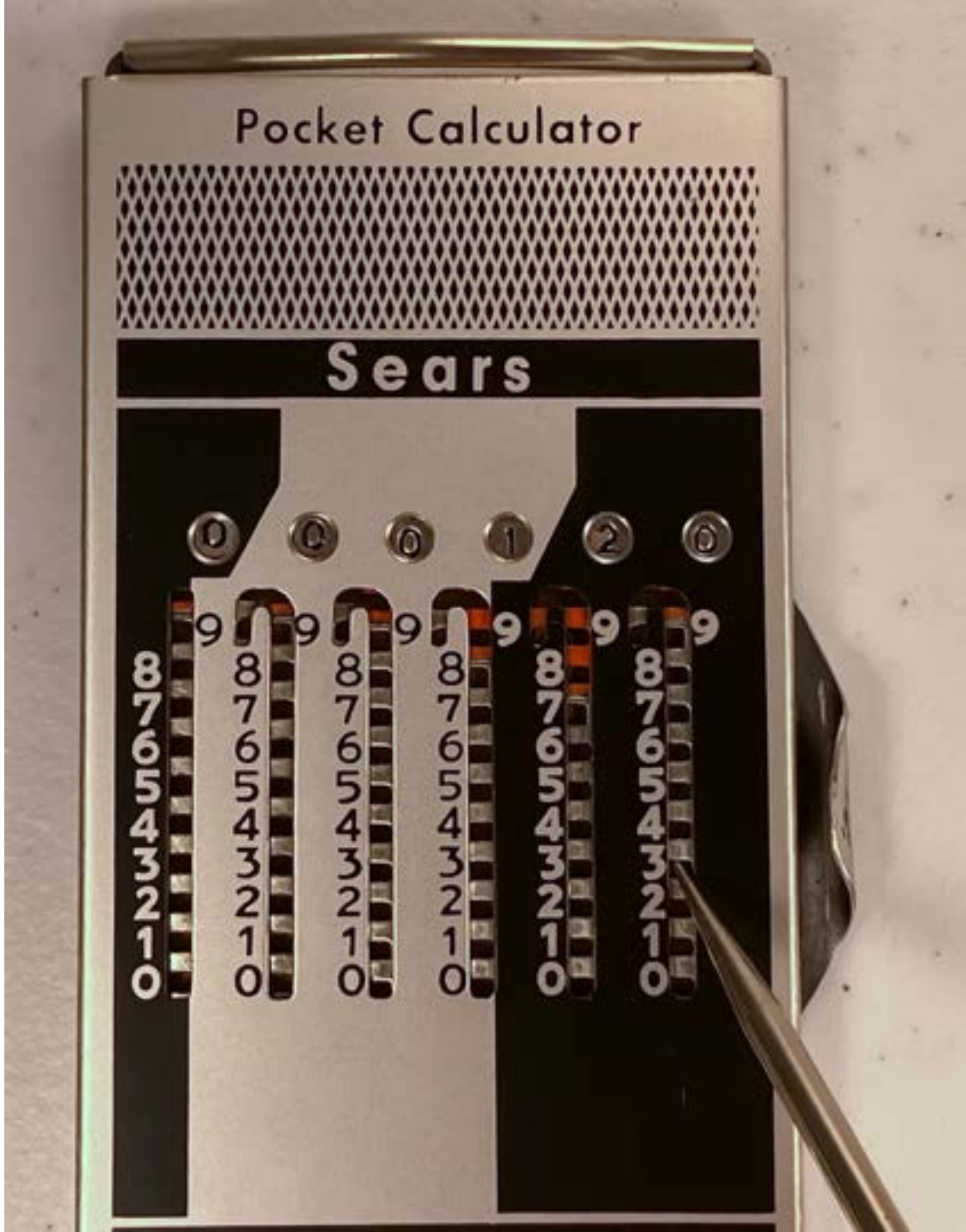
Sears Pocket Adder (1972)





Sears Pocket Adder (1972)

- Created from stamped sheet metal
- Physical "carry" mechanism



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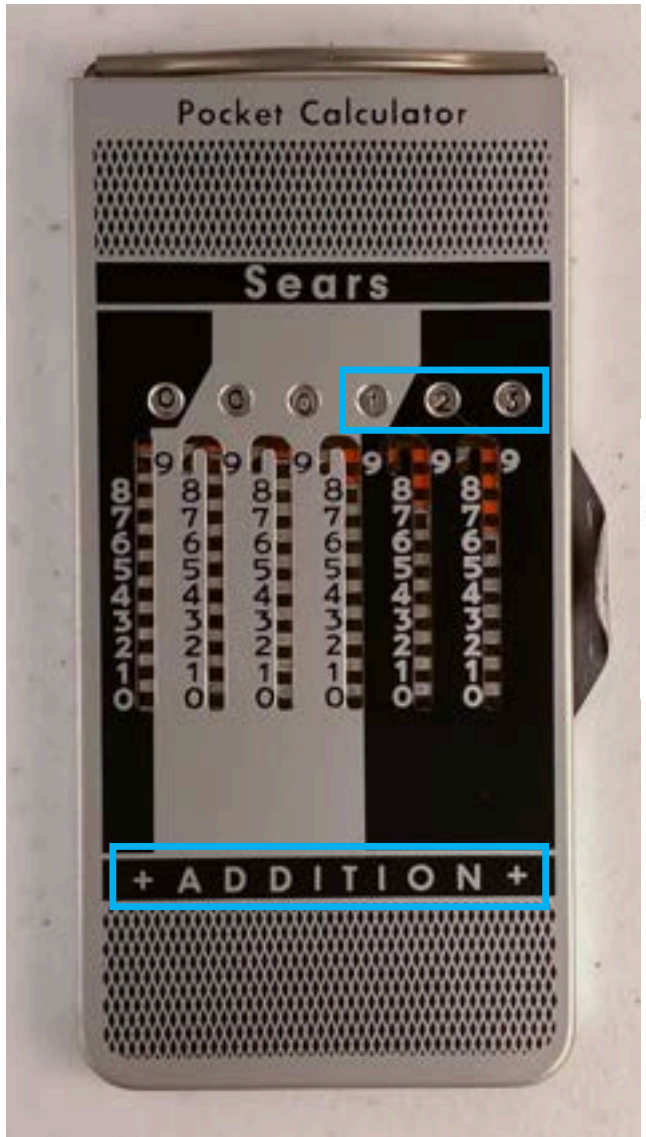
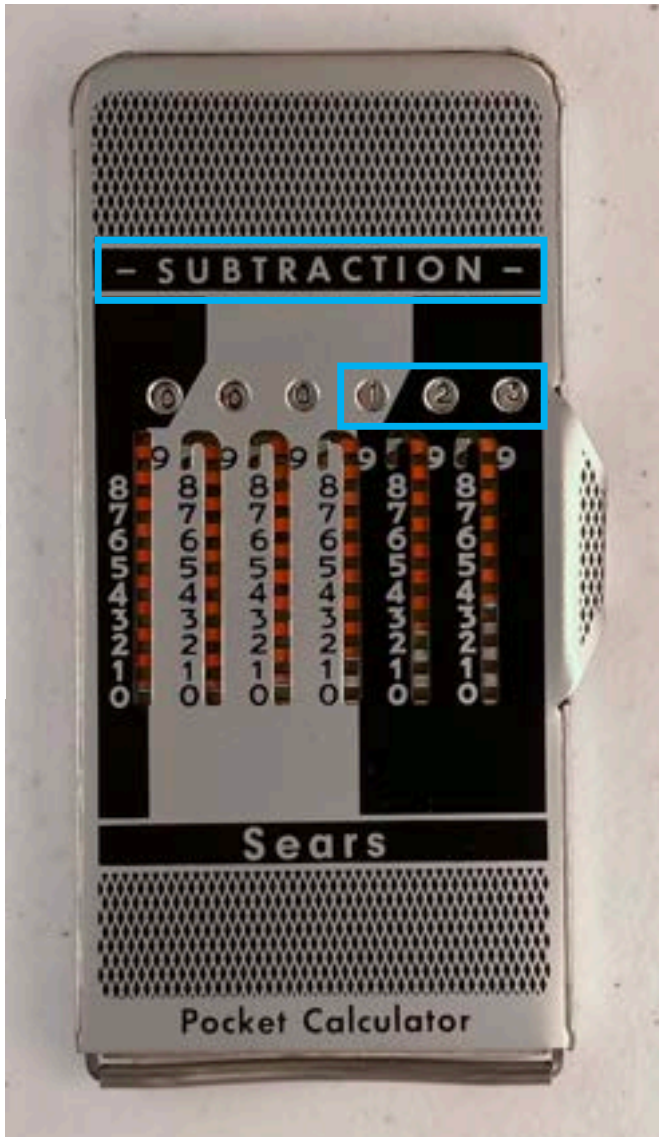
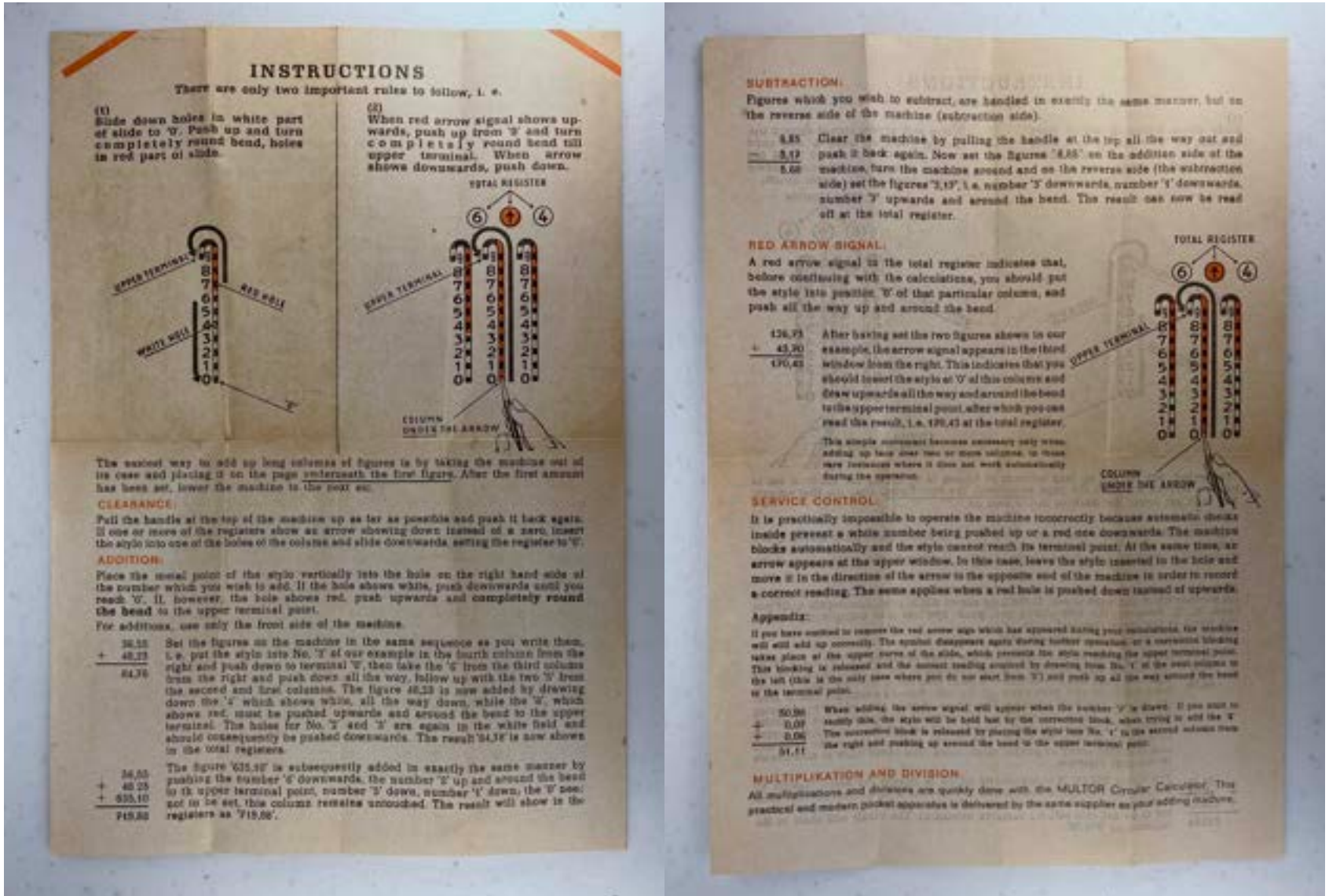


Flip for Subtraction



Sears Pocket Adder (1972)



INSTRUCTIONS

There are only two important rules to follow, i. e.

(1)
Slide down holes in white part of slide to '0'. Push up and turn completely round head, holes in red part of slide.

(2)
When red arrow signal shows upwards, push up from '0' and turn completely round head till upper terminal. When arrow shows downwards, push down.

The easiest way to add up long columns of figures is by taking the machine out of its case and placing it on the page underneath the first figure. After the first amount has been set, lower the machine to the next etc.

CLEARANCE:

Pull the handle at the top of the machine up as far as possible and push it back again. If one or more of the registers show an arrow showing down instead of a zero, insert the stylo into one of the holes of the column and slide downwards, setting the register to '0'.

ADDITION:

Place the metal point of the stylo vertically into the hole on the right hand side of the number which you wish to add. If the hole shows white, push downwards until you reach '0'. If, however, the hole shows red, push upwards and **completely round the head** to the upper terminal point.

For additions, use only the front side of the machine.

36,55
+ 48,23
84,78

Set the figures on the machine in the same sequence as you write them, i. e. put the stylo into No. '3' of our example in the fourth column from the right and push down to terminal '0', then take the '6' from the third column from the right and push down all the way, follow up with the two '5' from the second and first columns. The figure 48,23 is now added by drawing down the '4' which shows white, all the way down, while the '8', which shows red, must be pushed upwards and around the head to the upper terminal. The holes for No. '2' and '3' are again in the white field and should consequently be pushed downwards. The result '84,78' is now shown in the total registers.

36,55
+ 48,23
+ 635,10
719,88

The figure '635,10' is subsequently added in exactly the same manner by pushing the number '6' downwards, the number '5' up and around the head to th upper terminal point, number '3' down, number '1' down, the '0' pos; not to be set, this column remains untouched. The result will show in the registers as '719,88'.

SUBTRACTION:

Figures which you wish to subtract, are handled in exactly the same manner, but on the reverse side of the machine (subtraction side).

8,88
— 3,13
5,68

Clear the machine by pulling the handle at the top all the way out and push it back again. Now set the figures '8,88' on the addition side of the machine, turn the machine around and on the reverse side (the subtraction side) set the figures '3,13', i.e. number '3' downwards, number '1' downwards, number '3' upwards and around the head. The result can now be read off at the total register.

RED ARROW SIGNAL:

A red arrow signal in the total register indicates that, before continuing with the calculations, you should put the stylo into position '0' of that particular column, and push all the way up and around the head.

136,75
+ 43,90
170,45

After having set the two figures shown in our example, the arrow signal appears in the third window from the right. This indicates that you should insert the stylo at '0' of this column and draw upwards all the way and around the head to the upper terminal point, after which you can read the result, i.e. 170,45 at the total register.

This simple instrument becomes necessary only when adding up two, three, two or more columns, in those rare instances where it does not work automatically during the operation.

SERVICE CONTROL:

It is practically impossible to operate the machine incorrectly because automatic checks inside prevent a white number being pushed up or a red one downwards. The machine blocks automatically and the stylo cannot reach its terminal point. At the same time, an arrow appears at the upper window. In this case, leave the stylo inserted in the hole and move it in the direction of the arrow to the opposite end of the machine in order to record a correct reading. The same applies when a red hole is pushed down instead of upwards.

Appendix:

If you have omitted to remove the red arrow sign which has appeared during your calculations, the machine will still add up correctly. The symbol disappears again during further operation, or a corrective blocking takes place at the upper curve of the slide, which prevents the stylo reaching the upper terminal point. This blocking is released and the correct reading acquired by drawing from No. '1' of the next column to the left (this is the only case where you do not start from '0') and push up all the way around the head to the terminal point.

50,00
+ 0,07
+ 0,06
50,13

When adding, the arrow signal will appear when the number '0' is drawn. If you want to modify this, the stylo will be held fast by the corrective block, when trying to add the '0'. The corrective block is released by placing the stylo into No. '1' in the second column from the right and pushing up around the head to the upper terminal point.

MULTIPLIKATION AND DIVISION:

All multiplications and divisions are quickly done with the MULTOR Circular Calculator. This practical and modern pocket apparatus is delivered by the same supplier as your adding machine.

Sears 8 — Pocket Electronic Calculator (1975)

- "dual-powered"—use anywhere
  - batteries
  - 110-120-v., 60-c. AC
- "silently add, subtract, multiply and divide—even give negative answers"

Sears 8 — Pocket Electronic Calculator (1975)

- Easy to play with numbers
  - 12345678×8
  - $1 \div 7$
  - $1 \div 9$
  - $1 \div 6$
  - $12121212 \div 3$

Radio Shack EC-420
Low-Cost "Slide Rule" Calculator (1977)

- Calculator wars had begun!
  - U.S. vs. Japan
  - Inexpensive
- Vacuum Fluorescent Displays
  - Lower power

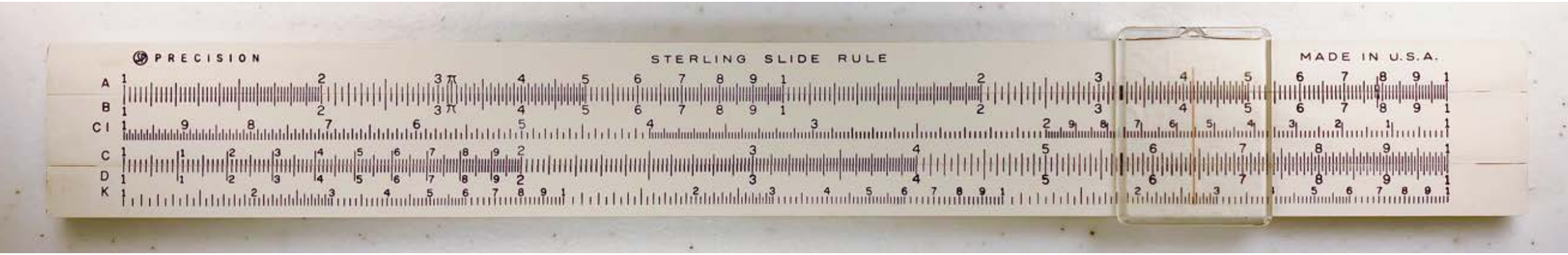
Radio Shack EC-420
Low-Cost "Slide Rule" Calculator (1977)

- "Special 'Pi' Key"
- Percent, Squares, Square Roots, Reciprocals
- Good for high-school science classes

Radio Shack EC-420 Low-Cost "Slide Rule" Calculator (1977)

- Easy to play with numbers
  - .9 x^2 x^2 x^2 x^2 x^2 x^2 x^2 x^2 x^2 x^2 x^2
  - .9 $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$
  - 1.1 $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$ $\sqrt{x}$
  - 7 $^1/x$ $^1/x$
  - 9 $^1/x$ $^1/x$
  - 6 $^1/x$ $^1/x$

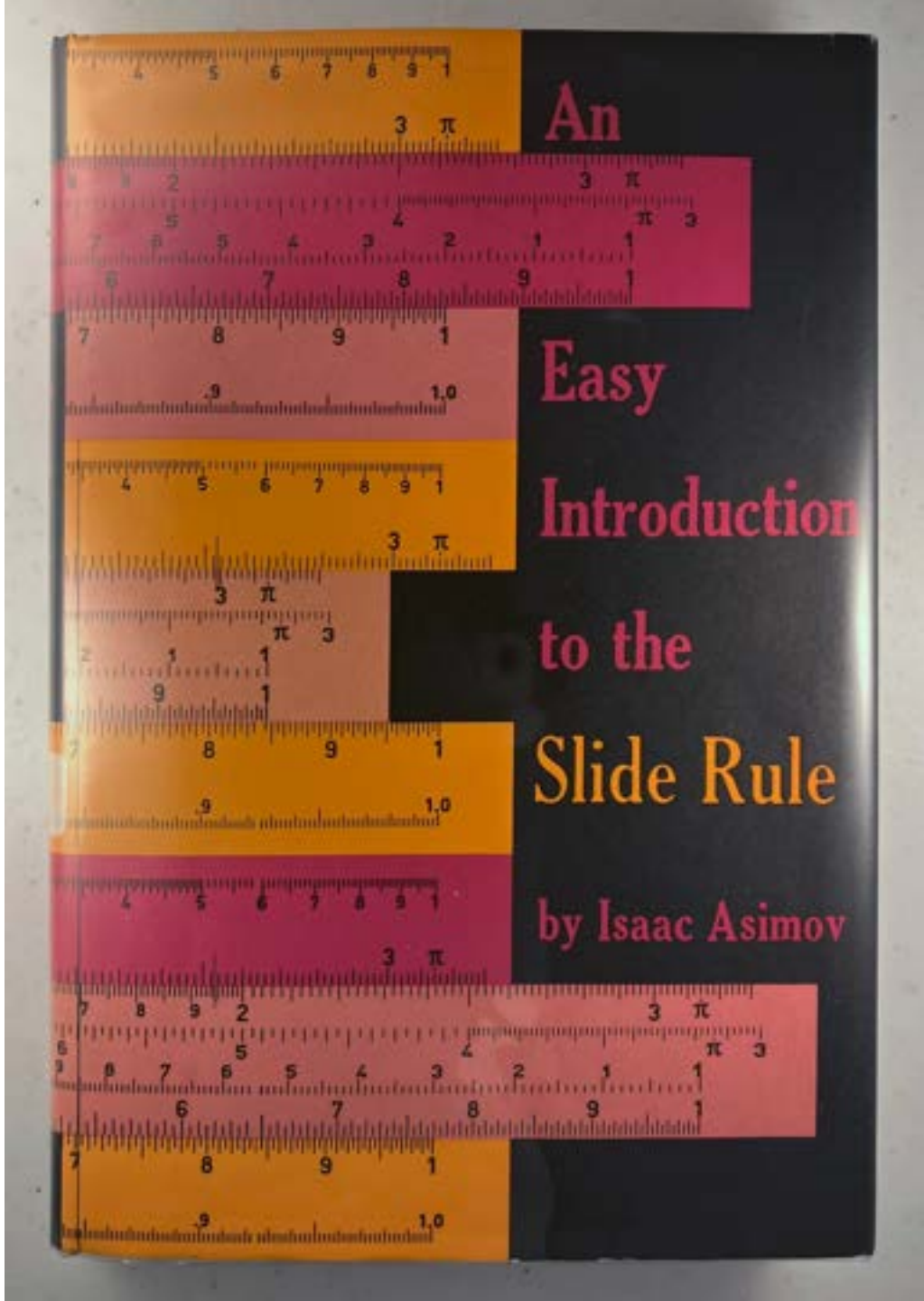
Dad's Sterling Slide Rule (1977)



- Knew that he had it, but I had no interest until . . .

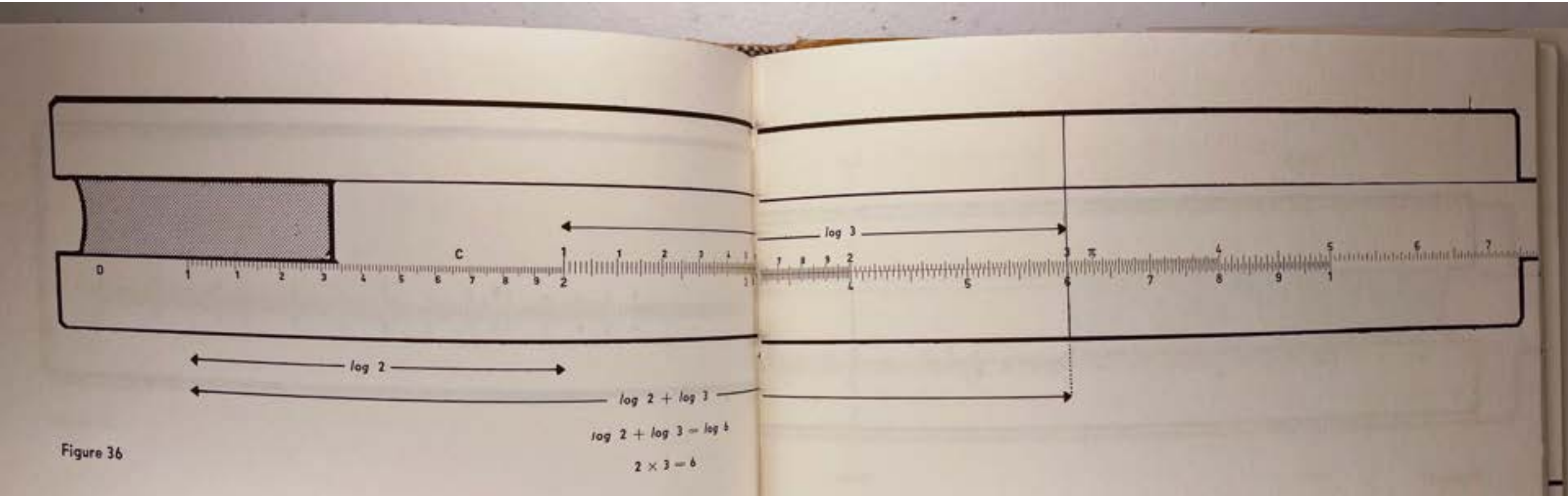
Dad's Slide Rule

- Was browsing through the high-school library
  - Dewey Decimal "500" series = mathematics
- A book about slide rules?
  - by Isaac Asimov?
- Checked it out (first person to do so)



Dad's Slide Rule

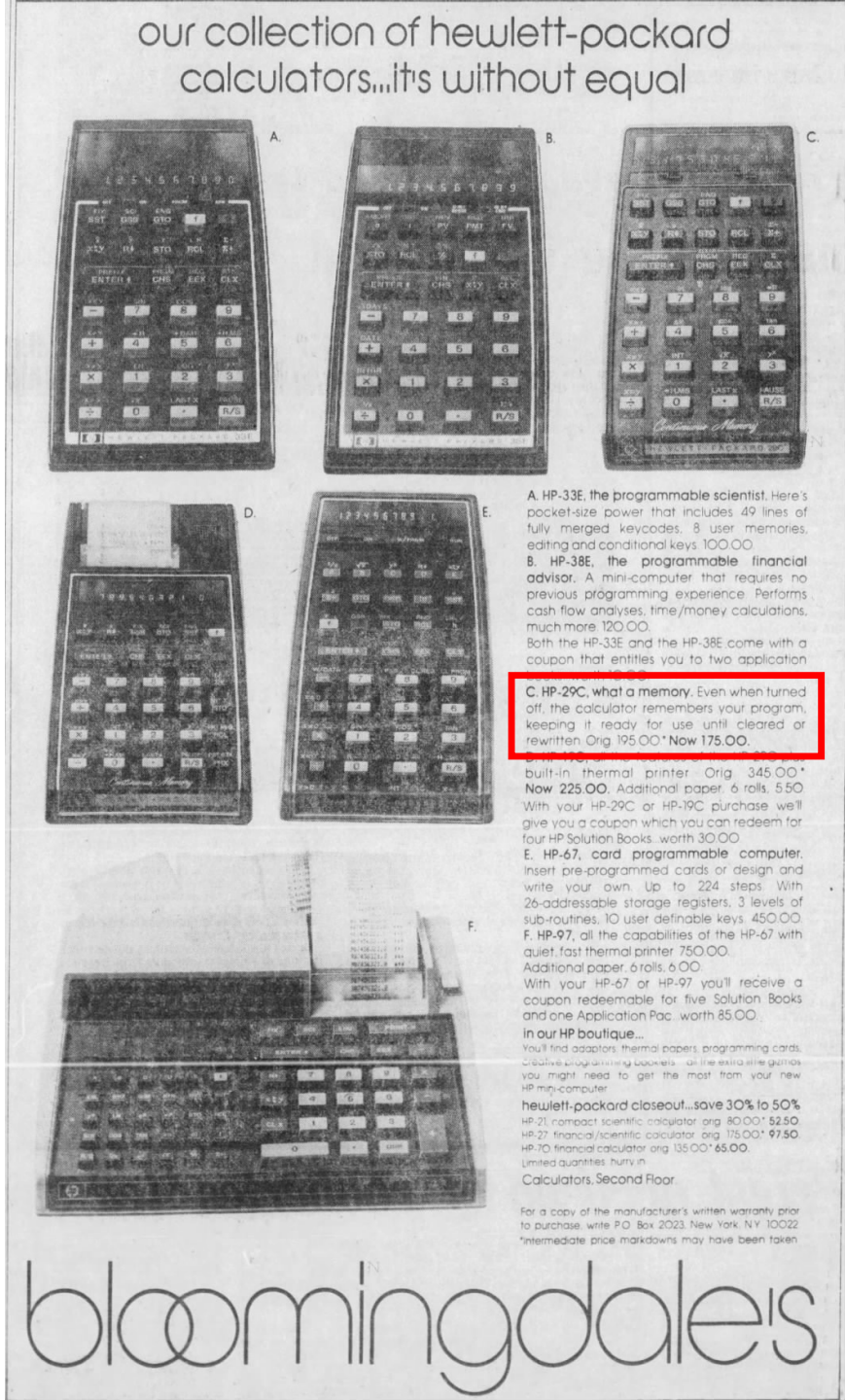
- Isaac Asimov taught me about logarithms
- Slide rules add and subtract logarithms



Hewlett-Packard HP-29C Scientific Calculator (1979)

- Somehow convinced my parents to buy me a tool for a working engineer

C. HP-29C, what a memory. Even when turned off, the calculator remembers your program, keeping it ready for use until cleared or rewritten. Orig. 195.00.* Now 175.00.



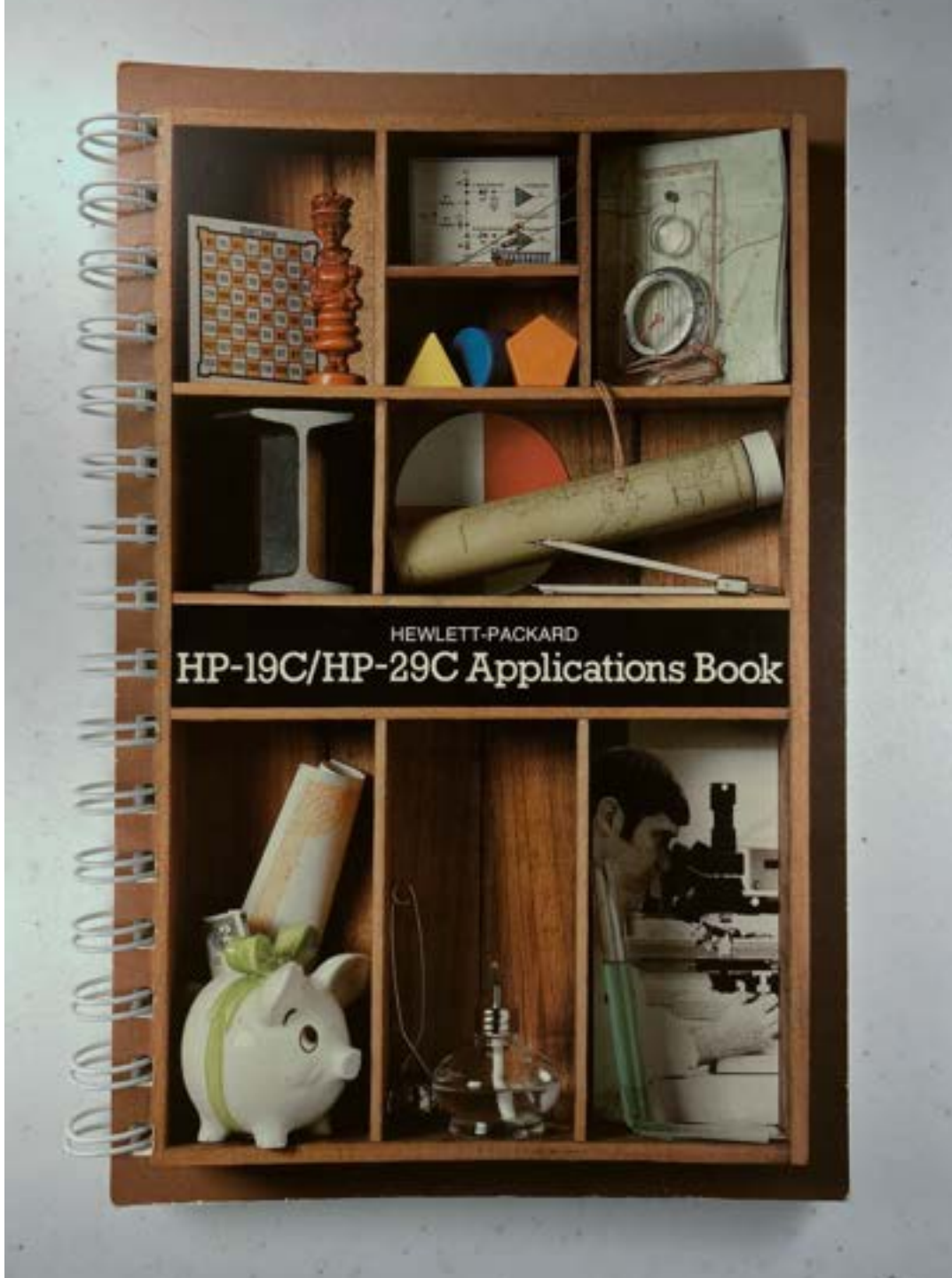
Hewlett-Packard HP-29C Scientific Calculator (1979)

- 98 programming instructions
- Similar to computer assembly language
- Has log, 10^x, ln, e^x
- Has time conversions H ⇄ H.MS
- Rectangular ⇄ Polar Conversions

Hewlett-Packard HP-29C Scientific Calculator (1979)

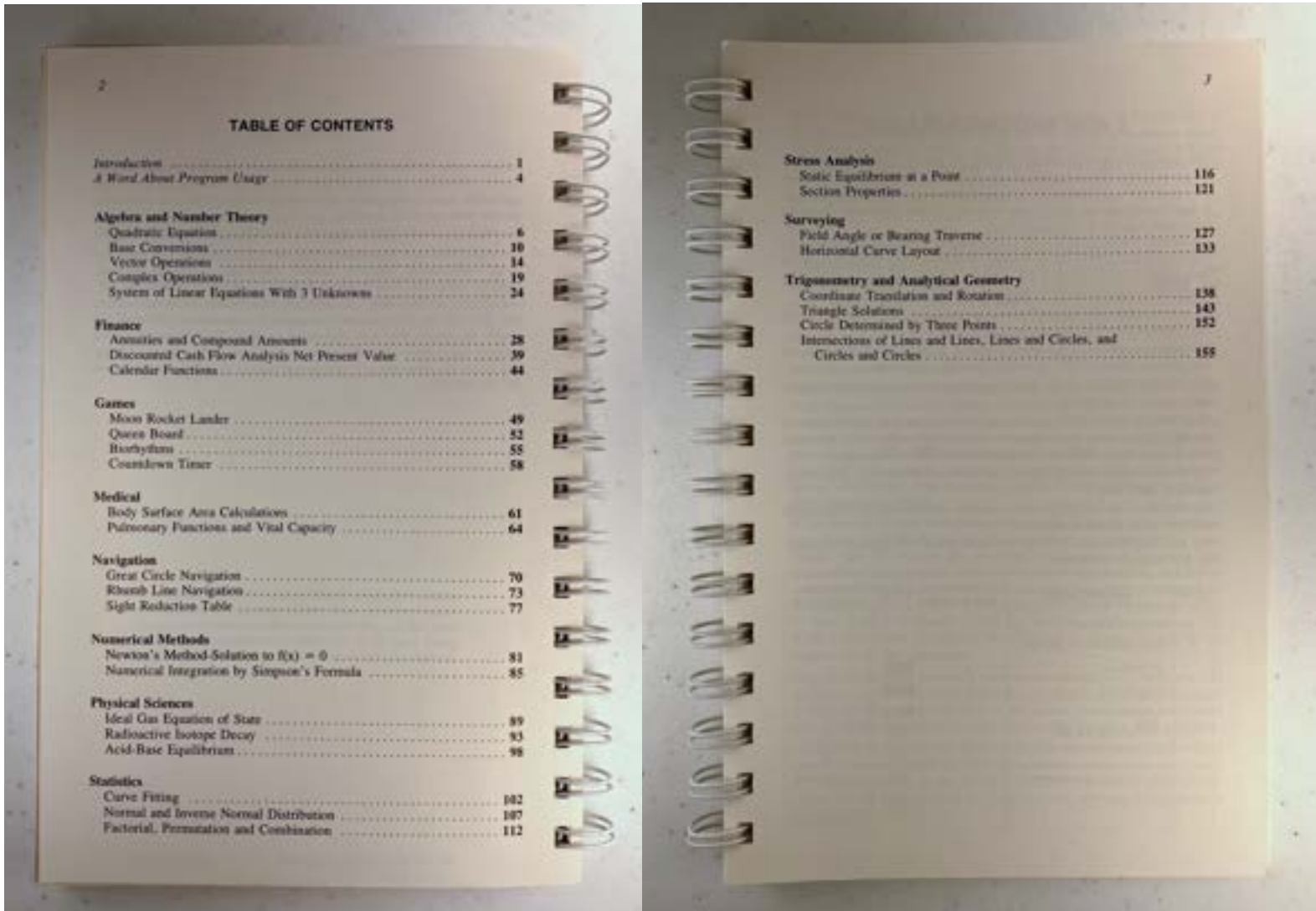
- But even better, an . . .

Applications Book



Hewlett-Packard HP-29C Scientific Calculator (1979)

- Exposed to concepts that normally I would not have been exposed to



2

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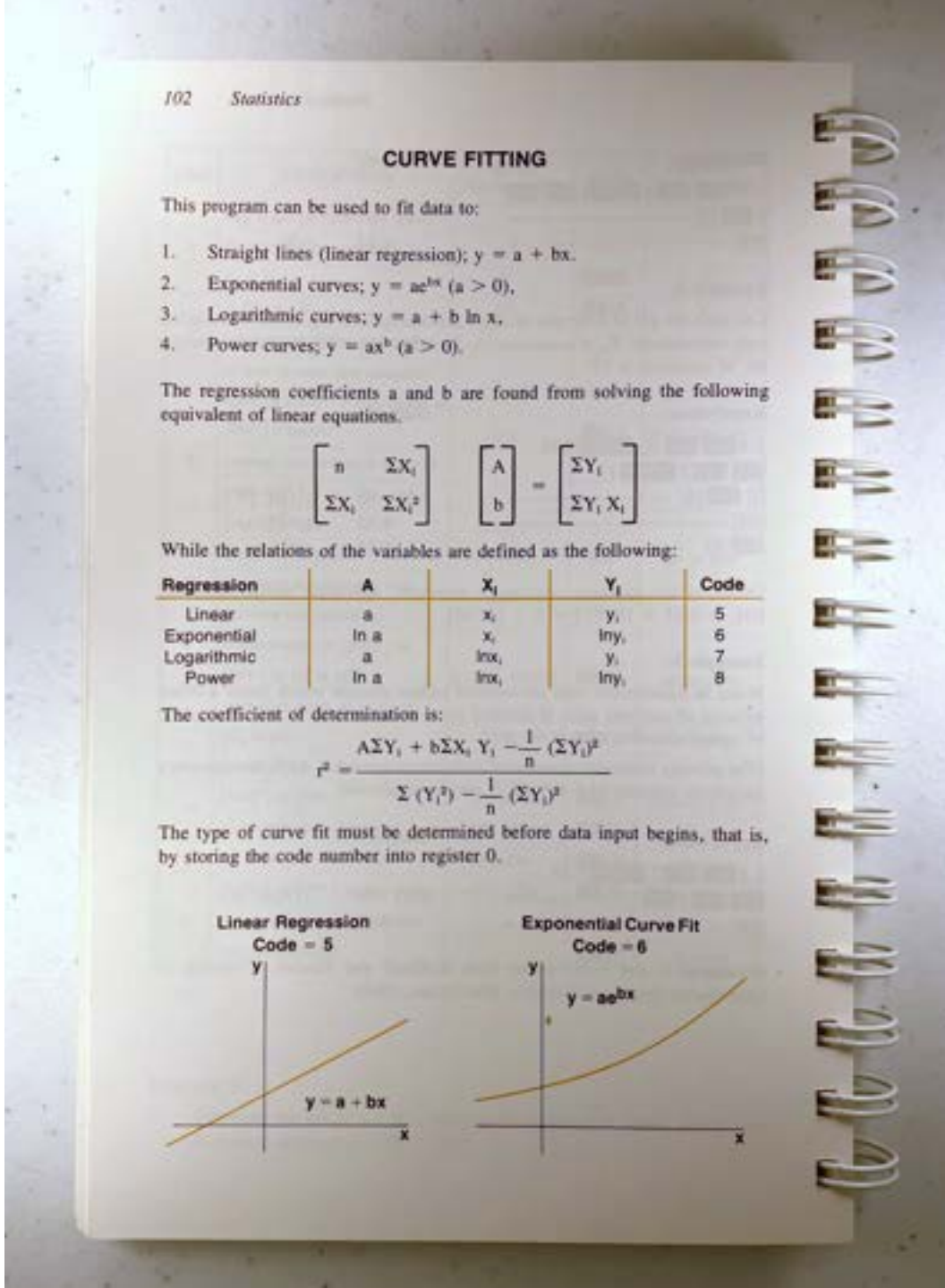
Hewlett-Packard HP-29C Scientific Calculator (1979)

- "Curve Fitting" (statistics)
- Fit several (x, y) data points to a . . .
  - straight linear line $y = ax + b$
  - exponential curve $y = ae^{bx}$
  - logarithmic curve $y = a + b \ln x$
  - power curve $y = ax^b$
- "coefficient of determination" r^2
  - closer to 1 means a good fit



102 *Statistics*

CURVE FITTING

This program can be used to fit data to:

1. Straight lines (linear regression); $y = a + bx$.
2. Exponential curves; $y = ae^{bx}$ $(a > 0)$,
3. Logarithmic curves; $y = a + b \ln x$,
4. Power curves; $y = ax^b$ $(a > 0)$.

The regression coefficients a and b are found from solving the following equivalent of linear equations.

$$\begin{bmatrix} n & \Sigma X_i \\ \Sigma X_i & \Sigma X_i^2 \end{bmatrix} \begin{bmatrix} A \\ b \end{bmatrix} = \begin{bmatrix} \Sigma Y_i \\ \Sigma Y_i X_i \end{bmatrix}$$

While the relations of the variables are defined as the following:

Regression	A	X_i	Y_i	Code
Linear	a	x_i	y_i	5
Exponential	ln a	x_i	$\ln y_i$	6
Logarithmic	a	$\ln x_i$	y_i	7
Power	ln a	$\ln x_i$	$\ln y_i$	8

The coefficient of determination is:

$$r^2 = \frac{A\Sigma Y_i + b\Sigma X_i Y_i - \frac{1}{n}(\Sigma Y_i)^2}{\Sigma (Y_i^2) - \frac{1}{n}(\Sigma Y_i)^2}$$

The type of curve fit must be determined before data input begins, that is, by storing the code number into register 0.

Linear Regression
Code = 5

Exponential Curve Fit
Code = 6

Hewlett-Packard HP-29C Scientific Calculator (1979)

- "Curve Fitting" (statistics)
- Fit several (x, y) data points to a . . .
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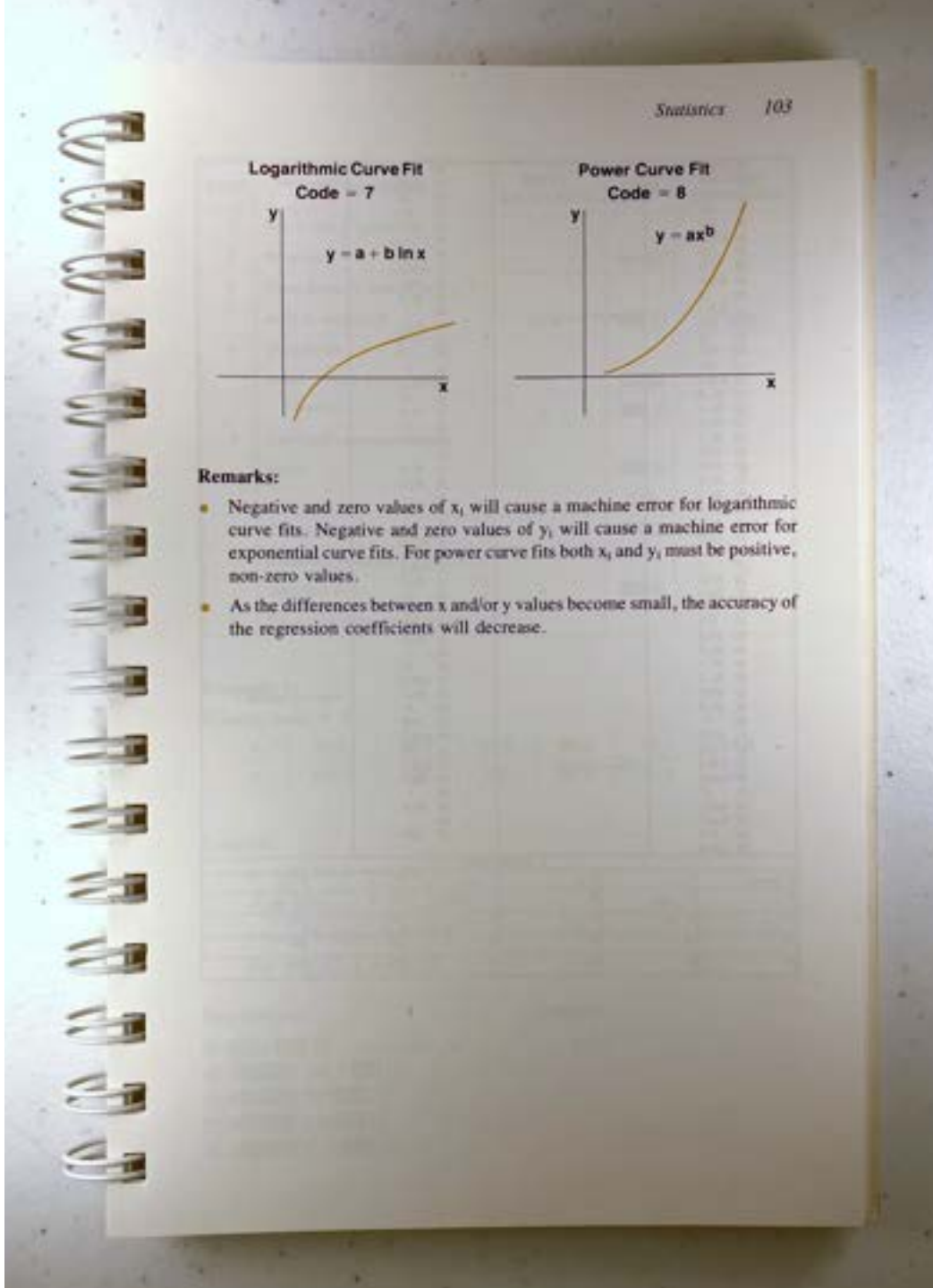
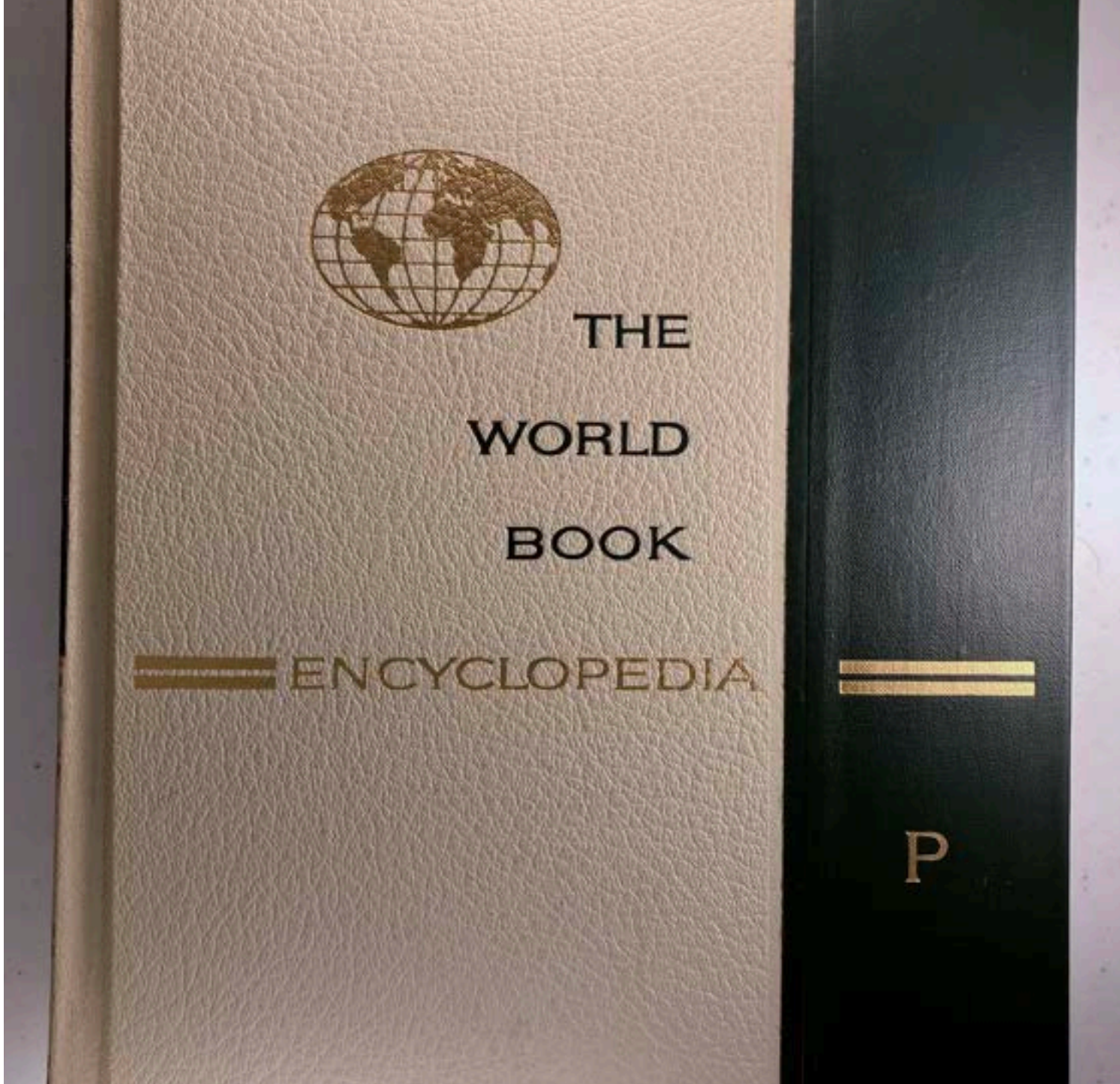


Hewlett-Packard HP-29C Scientific Calculator

- The World Book Encyclopedia has data



Vol. P

- Planet

PLANET. The planets are the heavenly bodies which move around the sun in nearly circular paths called *orbits*. The name *planet* was given by the ancient Greeks, and means *wanderer* in their language. This name was given because the planets constantly change their positions in relation to the stars.

There are nine planets, and the earth is one of them. Mercury is nearest to the sun, with Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto following in that order.

Mercury, Venus, Mars, Jupiter, and Saturn were known to the ancient astronomers. No one knew that the earth was a planet until the early 1500's, when the great Polish astronomer, Nicolaus Copernicus, showed that the sun was the center of the solar system, and that the earth revolved around it. Before his time, astronomers had believed that the earth was the center of the universe. Uranus was discovered by Sir William Herschel in 1781, and Neptune was located by mathematics in 1846. The ninth planet, Pluto, was not discovered until 1930. It lies a great distance beyond Neptune.

Venus, Mars, Jupiter, and Saturn can be seen easily with the naked eye. Mercury can seldom be seen with the unaided eye because it is so close to the sun that it sinks below the horizon before the sky is completely dark at night. If your eyes are keen, you can sometimes see Uranus on a clear night. A good pair of field glasses or a small telescope is needed to see Neptune.

Planets and Stars. Before the telescope was invented, the only way to tell a planet from a star was by the planet's movement and its steady shining. The stars do not seem to move and their lights twinkle rather than glow. (See FIXED STAR.) With the telescope, astronomers could see that planets appeared as round discs. But the distant stars always appeared as points of light, no matter how much the telescope magnified them. Astronomers today define a star as a body of matter in space which gives off its own light. They believe the stars are gaseous, like our sun, which is a star. The planets are smaller bodies of matter which are no longer gaseous, and which give off no light of their own, but merely reflect the light of our sun.

Size and Distances from the Sun. Except for Mercury and Pluto, the farther the planets are from the sun, the farther they are from each other. The distances are expressed in *astronomical units*. This unit is the average distance of the earth from the sun, or approximately 93,000,000 miles.

The planets differ greatly from one another in size.

THE PLANETS

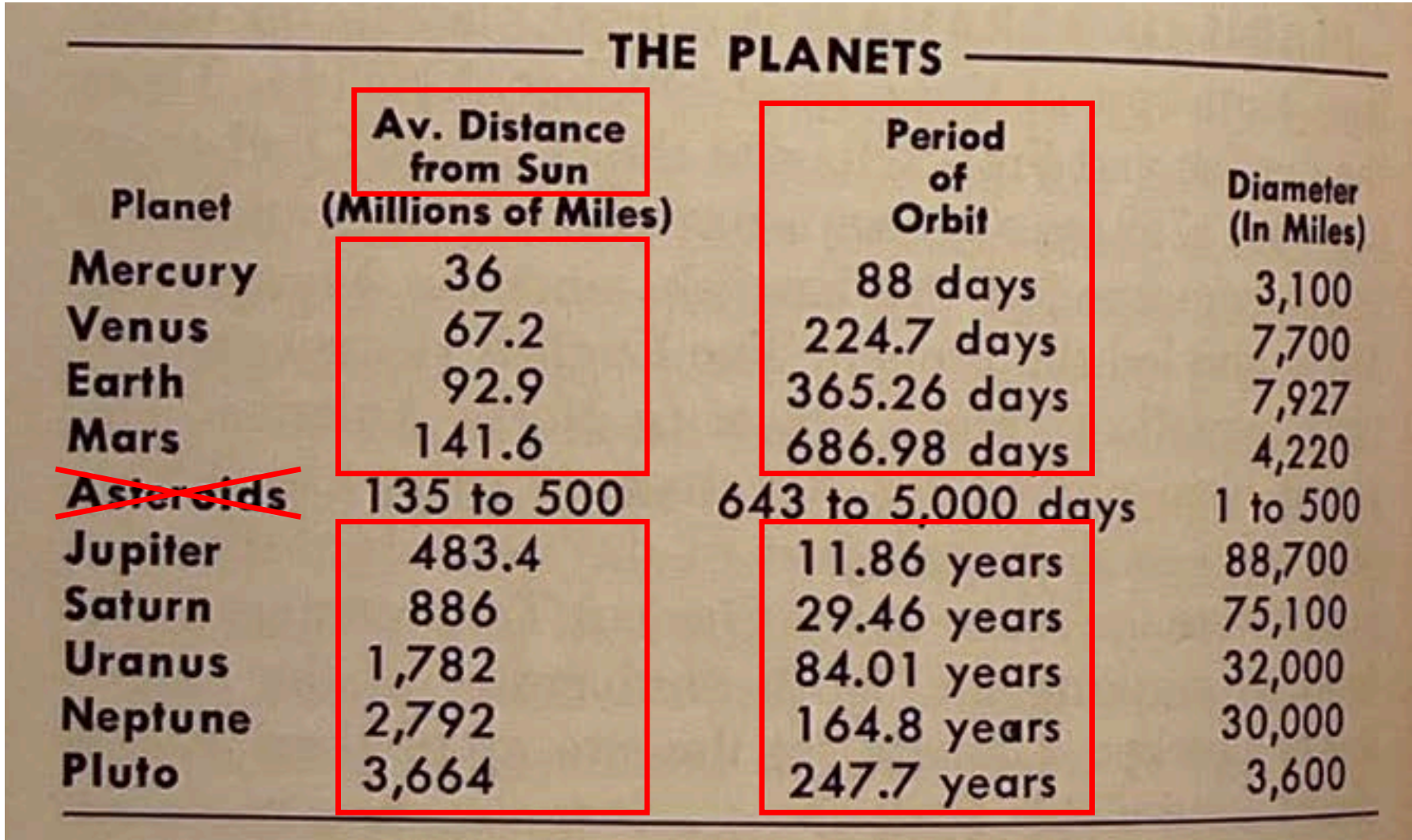
Planet	Av. Distance from Sun (Millions of Miles)	Period of Orbit	Diameter (In Miles)
Mercury	36	88 days	3,100
Venus	67.2	225 days	7,700
Earth	93	365 days	7,927
Mars	141.6	687 days	4,200
Asteroids	135 to 500	643 to 5,000 days	1 to 500
Jupiter	483	11.9 years	88,700
Saturn	886	29.5 years	71,500
Uranus	1,782	84 years	32,000
Neptune	2,794.1	164.8 years	27,700
Pluto	3,700	248.4 years	3,100 to 3,600

The smallest planet is Mercury, which is about one sixteenth the size of the earth. Venus is almost as large as the earth, but Mars is only one seventh as large. Saturn is 730 times as large as our planet. Uranus is sixty-four times as large, and Neptune is sixty times as large as the earth. Jupiter is more than 1,300 times as large as the earth.

This does not necessarily mean that Jupiter, for example, has 1,300 times as much matter as does the earth. The amount of matter in a body depends upon

Hewlett-Packard HP-29C Scientific Calculator (1979)

- Data!



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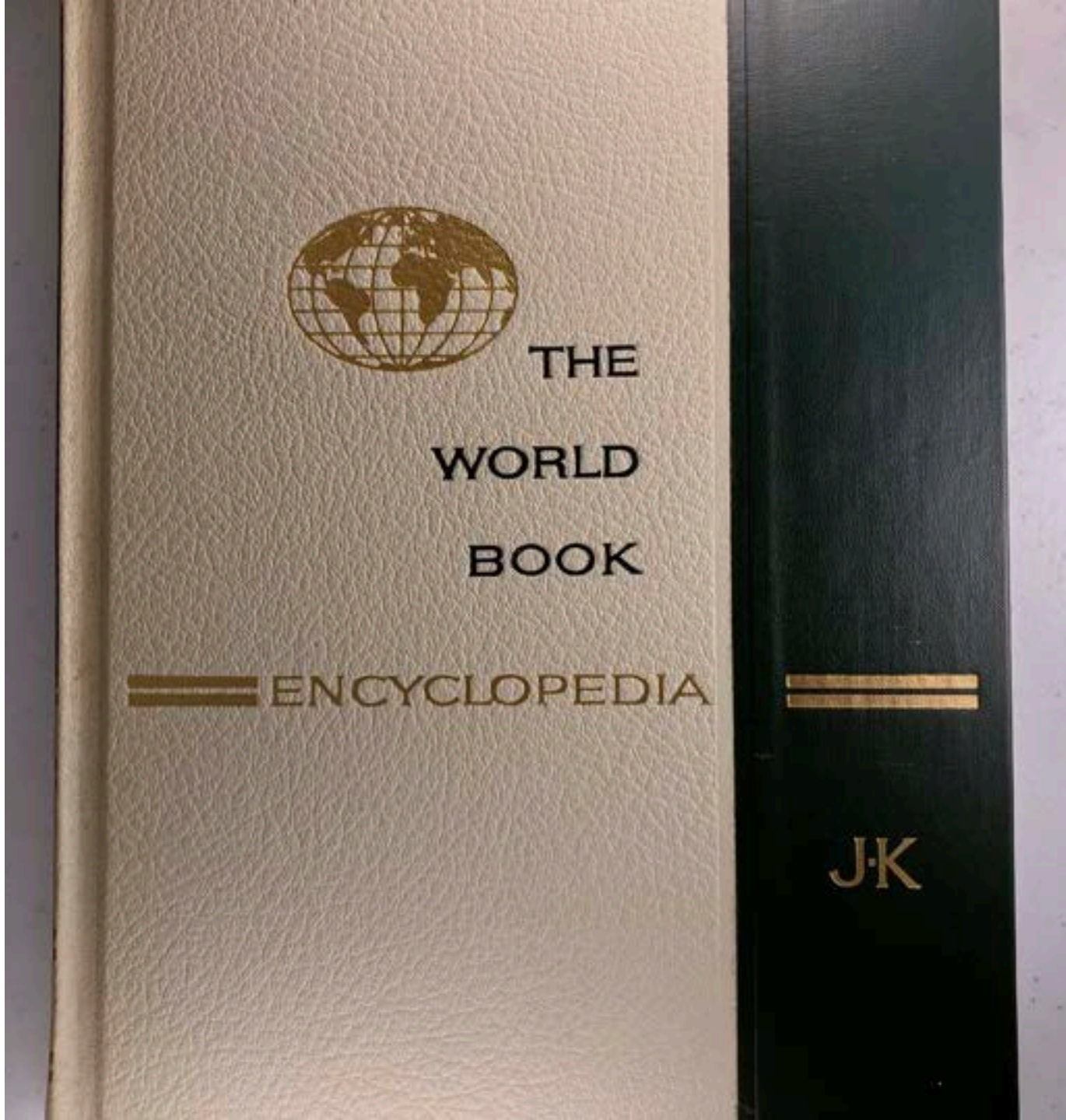
Planet	Av. Distance from Sun (Millions of Miles)	Period of Orbit	Diameter (In Miles)
Mercury	36	88 days	3,100
Venus	67.2	224.7 days	7,700
Earth	92.9	365.26 days	7,927
Mars	141.6	686.98 days	4,220
~~Asteroids~~	135 to 500	643 to 5,000 days	1 to 500
Jupiter	483.4	11.86 years	88,700
Saturn	886	29.46 years	75,100
Uranus	1,782	84.01 years	32,000
Neptune	2,792	164.8 years	30,000
Pluto	3,664	247.7 years	3,600

Hewlett-Packard HP-29C Scientific Calculator

- The World Book Encyclopedia has concepts

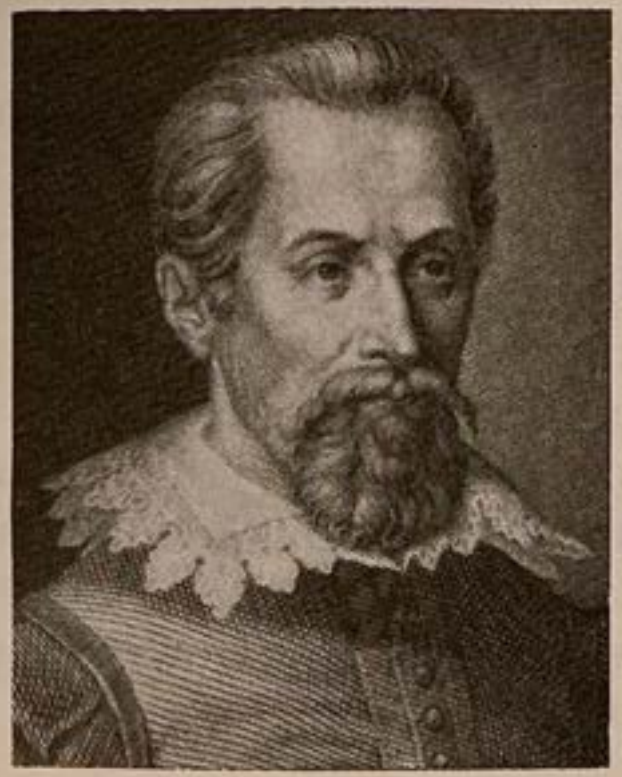


Kepler's Three Laws of Planetary Motion

KEPLER, JOHANNES (1571-1630), a German astronomer and mathematician, discovered three laws of planetary motion. His three laws later formed an indispensable part of the foundation of Sir Isaac Newton's discovery of universal gravitation (see ELLIPSE; GRAVITATION [Newton's Law of Gravitation]):

Johannes Kepler

Brown Bros.



(1) Every planet follows an oval-shaped path, or *orbit*, around the sun, called an *ellipse*. The sun is located at one focus of the elliptical orbit.

(2) An imaginary line from the center of the sun to the center of a planet sweeps out the same area in a given time. This means that planets move faster when they are closer to the sun.

(3) The time taken by a planet to make one complete trip around the sun is its *period*. The squares of the periods of two planets are proportional to the cubes of their mean distances from the sun.

Kepler was born at Weil, Germany, and was graduated from the University of Tübingen. He accepted an offer to teach mathematics and other subjects at the Lutheran school in Graz. But he left Graz rather than undergo compulsory conversion to Roman Catholicism. While seeking another post, he formed an association with Tycho Brahe, which shaped the rest of his life (see BRAHE, TYCHO).

Brahe, the greatest astronomical observer before the introduction of the telescope, needed an assistant, and Kepler joined him. After Brahe died, Rudolph II, the

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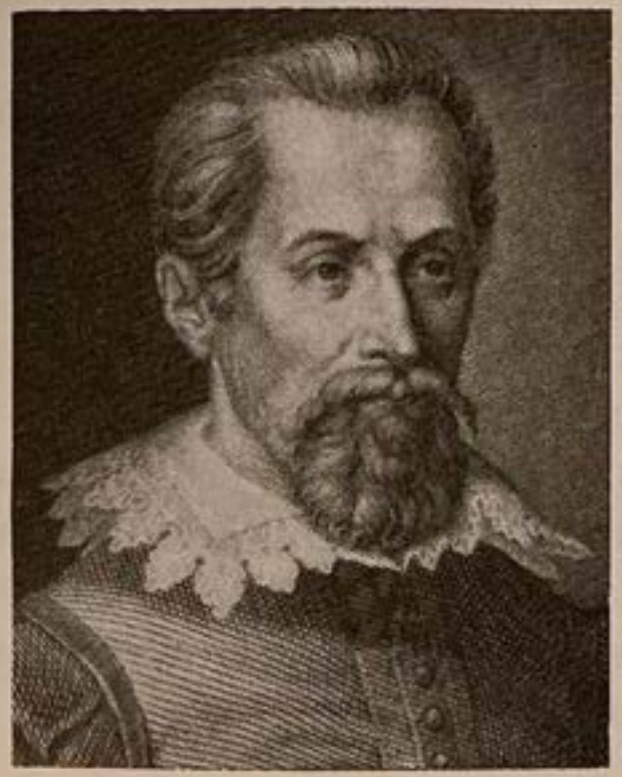

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$$y^2 \propto x^3$$

Kepler was born at Weil, Germany, and was graduated from the Un... ...ccepted an offer to teach ma... ...cts at the Lutheran school i... ...ather than undergo compulso... ...tholicism. While seeking an... ...ssociation with Tycho Brahe, ...is life (see BRAHE, TYCHO).

Brahe, the great... ...before the introduction of the... ...stant, and Kepler joined him. After Brahe died, Rudolph II, the

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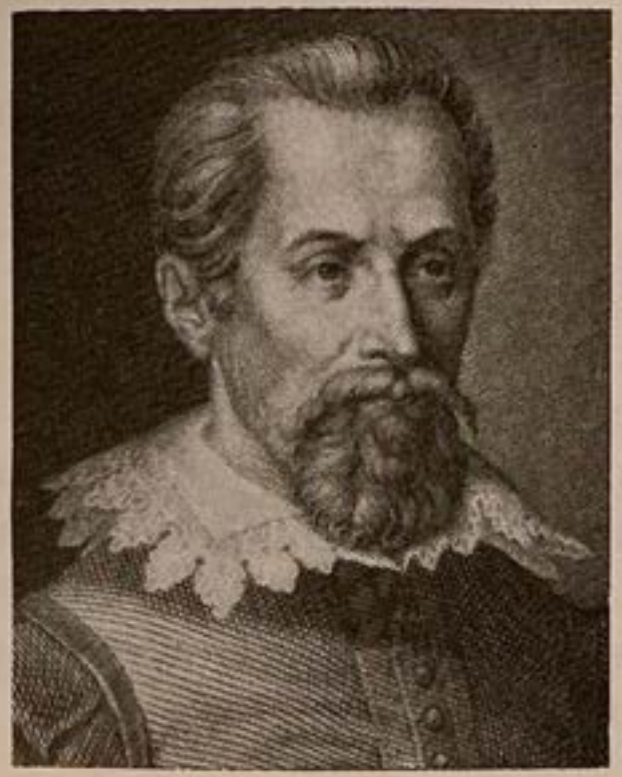


(1) Every planet follows an oval-shaped path, or *orbit*, around the sun, called an *ellipse*. The sun is located at one focus of the elliptical orbit.

(2) An imaginary line from the center of the sun to the center of a planet sweeps out the same area in a given time. This means that planets move faster when they are closer to the sun.

(3) The time taken by a planet to make one complete trip around the sun is its *period*. The squares of the periods of two planets are proportional to the cubes of their mean distances from the sun.

Kepler was born at Weil, Germany, and was graduated from the Un ccepted an offer to teach ma cts at the Lutheran school i ather than undergo compulso tholicism. While seeking an ssociation with Tycho Brahe, is life (see BRAHE, TYCHO).

Brahe, the great before the introduction of the stant, and Kepler joined him. After Brahe died, Rudolph II, the

$$y^2 \propto x^3$$

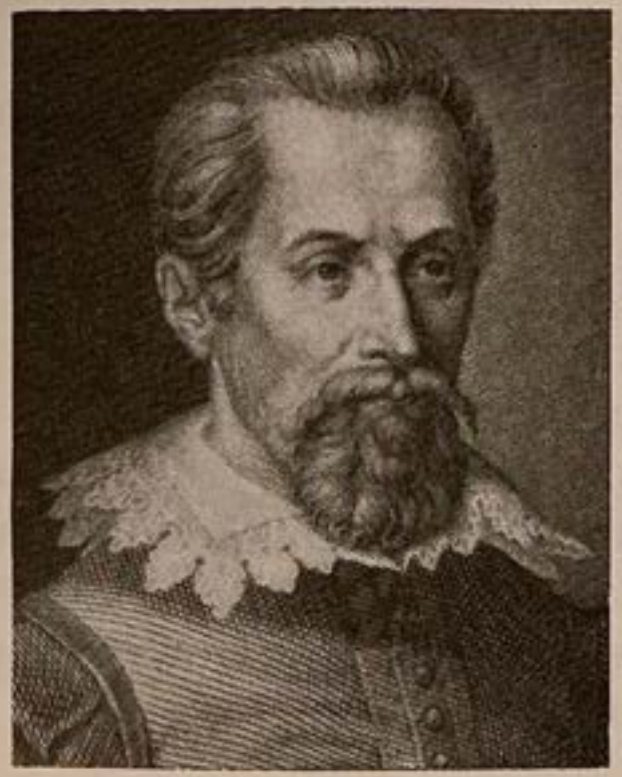
$$y \propto x^{1.5}$$

Kepler's Three Laws of Planetary Motion

KEPLER, JOHANNES (1571-1630), a German astronomer and mathematician, discovered three laws of planetary motion. His three laws later formed an indispensable part of the foundation of Sir Isaac Newton's discovery of universal gravitation (see ELLIPSE; GRAVITATION [Newton's Law of Gravitation]):

Johannes Kepler

Brown Bros.



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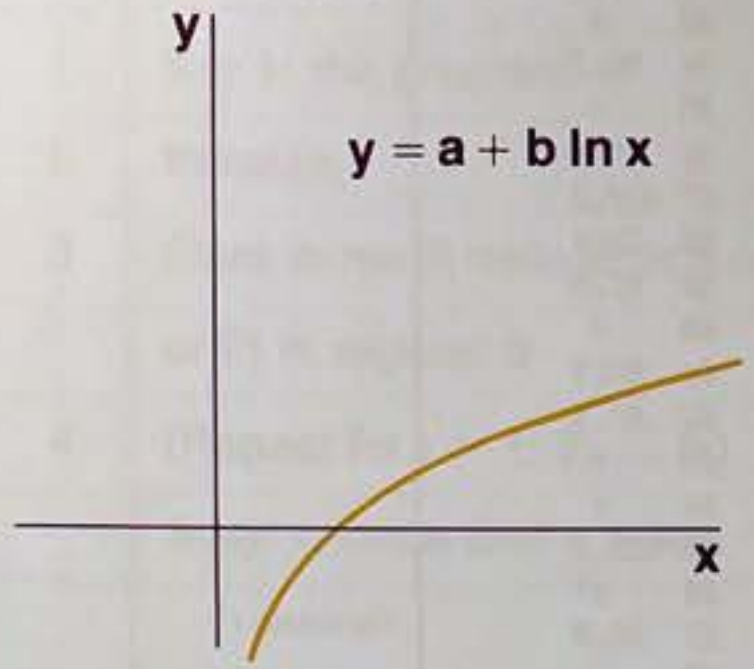
$$y^2 \propto x^3$$

$$y \propto x^{1.5}$$

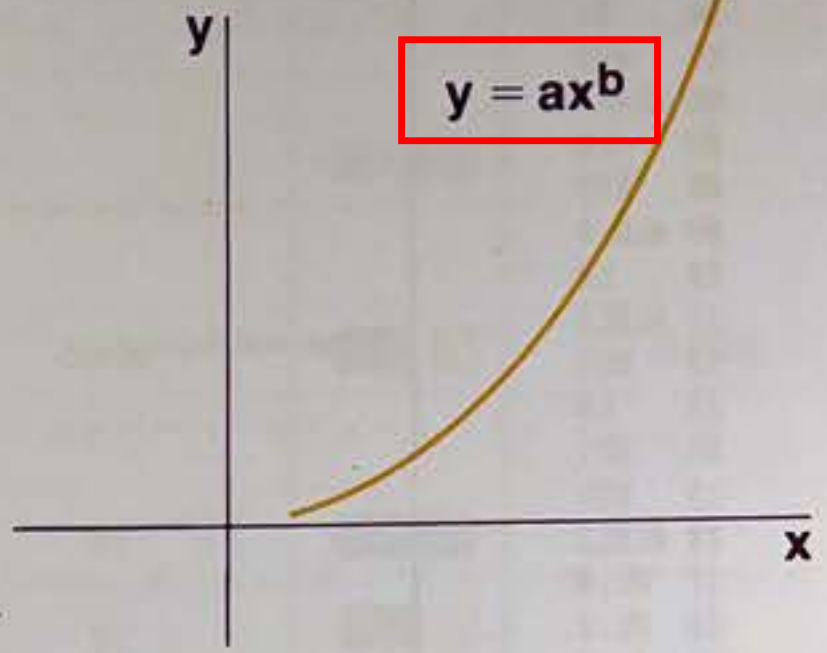
$$y = a\,x^{1.5}$$

Hewlett-Packard HP-29C Scientific Calculator (1979)

Logarithmic Curve Fit
Code = 7

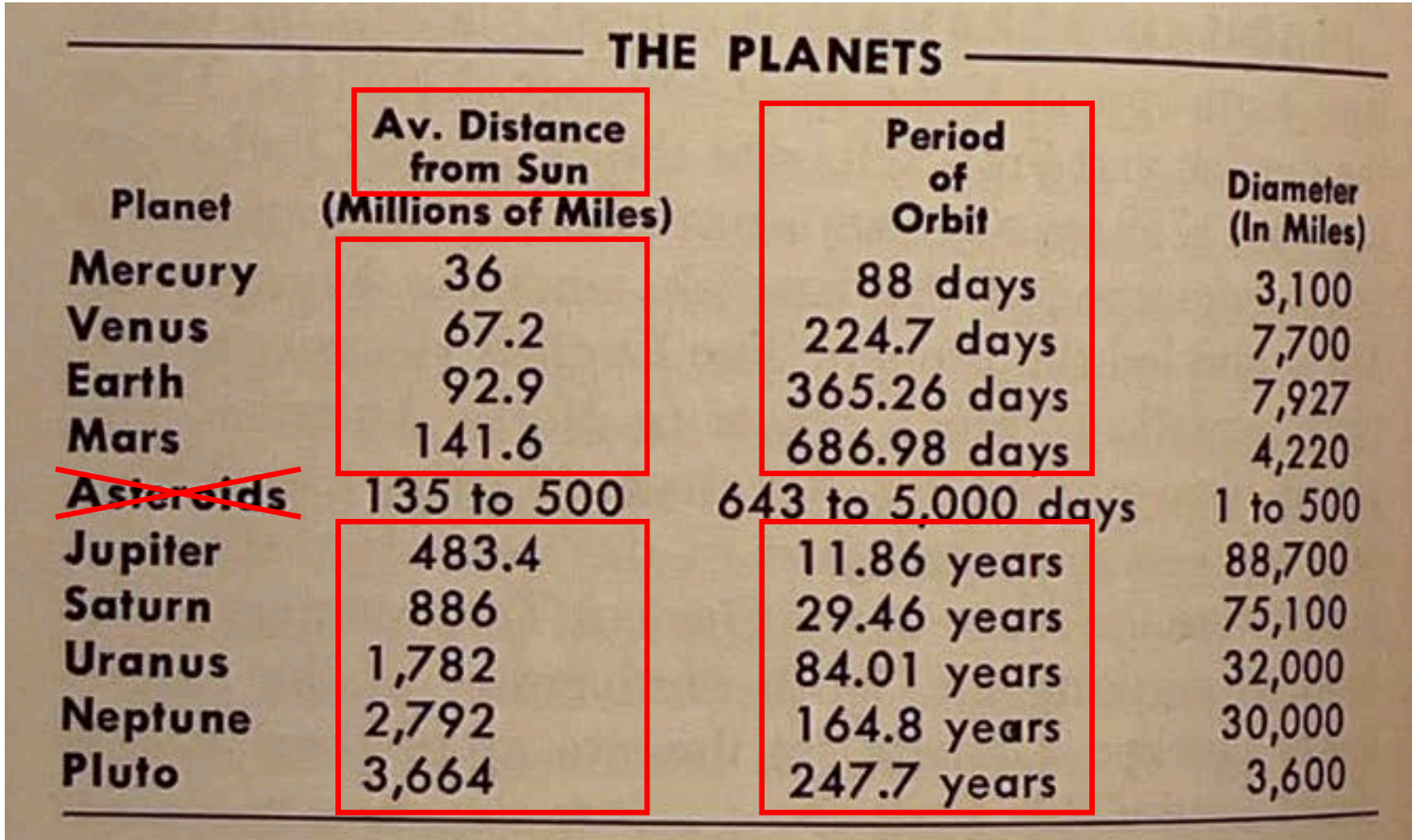


Power Curve Fit
Code = 8



Hewlett-Packard HP-29C Scientific Calculator (1979)

- Enter the Curve Fitting Program
- Enter the Data



THE PLANETS

Planet	Av. Distance from Sun (Millions of Miles)	Period of Orbit	Diameter (In Miles)
Mercury	36	88 days	3,100
Venus	67.2	224.7 days	7,700
Earth	92.9	365.26 days	7,927
Mars	141.6	686.98 days	4,220
~~Asteroids~~	135 to 500	643 to 5,000 days	1 to 500
Jupiter	483.4	11.86 years	88,700
Saturn	886	29.46 years	75,100
Uranus	1,782	84.01 years	32,000
Neptune	2,792	164.8 years	30,000
Pluto	3,664	247.7 years	3,600

Hewlett-Packard HP-41C Scientific Calculator (1980)

HP introduces new, versatile calculator

By Mike McCraken
Of The Gazette-Times

The Corvallis division of Hewlett-Packard Co. introduced today the most versatile and advanced hand-held calculator it has ever manufactured.

"It's probably the most significant product we've introduced in some time," Glenn Theodore, product manager, said of the new HP-41C.

The HP-41C, which retails for $295, features a number of revolutionary features that make it a powerful personal computing device useful to the technician, businessman or student, Theodore said.

After more than two years in the development stages, the HP-41C joins the 11 other hand-held models the division produces in Corvallis.

The new calculator was designed at the Corvallis division, and Theodore said much of the division's research and development department was devoted to the project.

About 90 percent of the calculator's parts will be produced locally, Theodore said.

He said the company hopes to obtain a "significant" revenue growth through sale of the new product, although HP does not publicize many sales figures because of the highly competitive nature of the calculator business.

The company employs 1,250 employees at its Corvallis division and has a monthly payroll of $1.8 million.

Theodore said production of the new calculator will not require the hiring of large numbers of new employees, and said employment at the firm should continue to grow at about 10 percent per year.

The new calculator is called "alphanumeric" because it "communicates" with the user in both numeric and alphabetic characters.

Users of the calculator can purchase, at extra cost, a number of options:

— Up to four memory "modules" can be plugged into the back of the calculator to effectively quintuple its memory capacity.

— A plug-in card reader allows the user to enter programs from recorded magnetic cards or to record programs on blank cards.

— A portable thermal, or inkless, printer provides hard copy records of calculations, high-resolution plots, and complete alphabetic and numeric output.

— An optical wand (to be available in 1980) will enable the user to rapidly read and enter programs or data from printed bar codes.

— Sixteen plug-in application modules, offering a variety of additional business and science programs, can be used in addition to the calculator's existing programs.

The HP-41C can be connected to these devices through four electronic, built-in sockets.

Among its major features, in addition to its ability to "grow" through the use of additional programs, is the calculator's "continuous memory," Theodore said.

This allows information to be retained in the calculator's memory systems after power has been turned off, compared to other calculators which lose memory information when the power is cut.

The calculator, which contains 130 pre-programmed scientific amd mathematical functions, also features a liquid crystal display, rather than light-emitting diodes, as used in previous Hewlett-Packard models.

The liquid crystals use far less energy than the diodes, and enable company engineers to build the calculator so that it uses throw-away alkaline batteries rather than rechargeable nickle-cadmium batteries.

While the rechargeable batteries in other calculators have a life of up to six hours before they need to be recharged, the alkaline batteries will last nine months to a year and are more economical, Theodore said.

"The HP-41C is 100 percent faster than earlier HP models, contains up to four times the memory capacity with available options, and has 40 percent more standard functions," President Richard Moore said of the new calculator.

Major markets for the products from the Corvallis division include the United States, Japan and much of Europe, as well as several Latin American countries.

"Introduction of the HP-41C clearly establishes our leadership in the production of hand-held calculators for professional use," Theodore said.

"It is clearly unmatched by any of our competitors."

Hewlett-Packard HP-41C Scientific Calculator (1980)

- Many more functions
- Alphabetic keys let you enter functions that are not on the keyboard
- Get good at typing the more common functions
  - [XEQ] [Alpha] P R O M P T [Alpha]

Hewlett-Packard HP-41C Scientific Calculator (1980)

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- Alphabetic keys let you enter functions that are not on the keyboard
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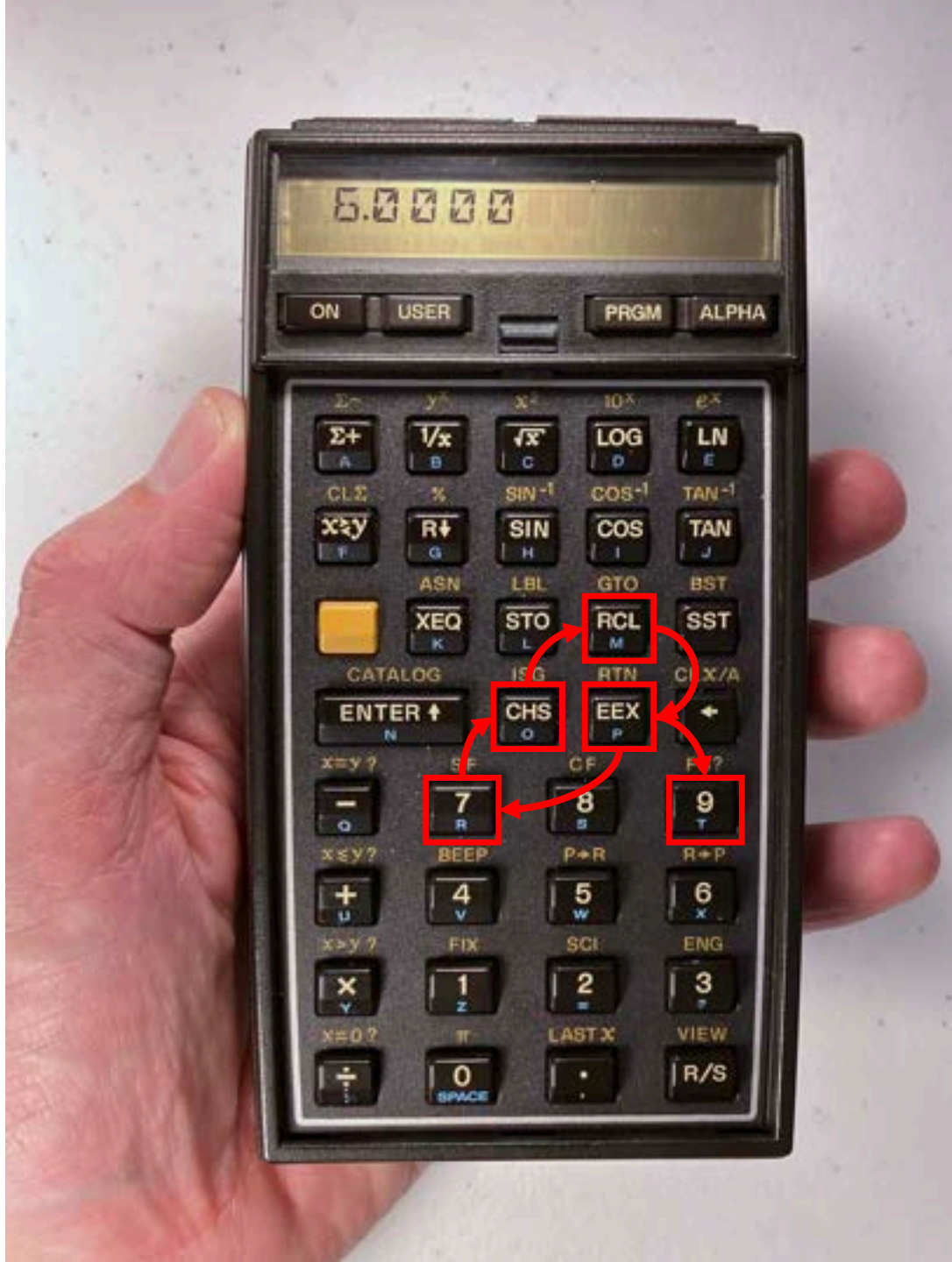
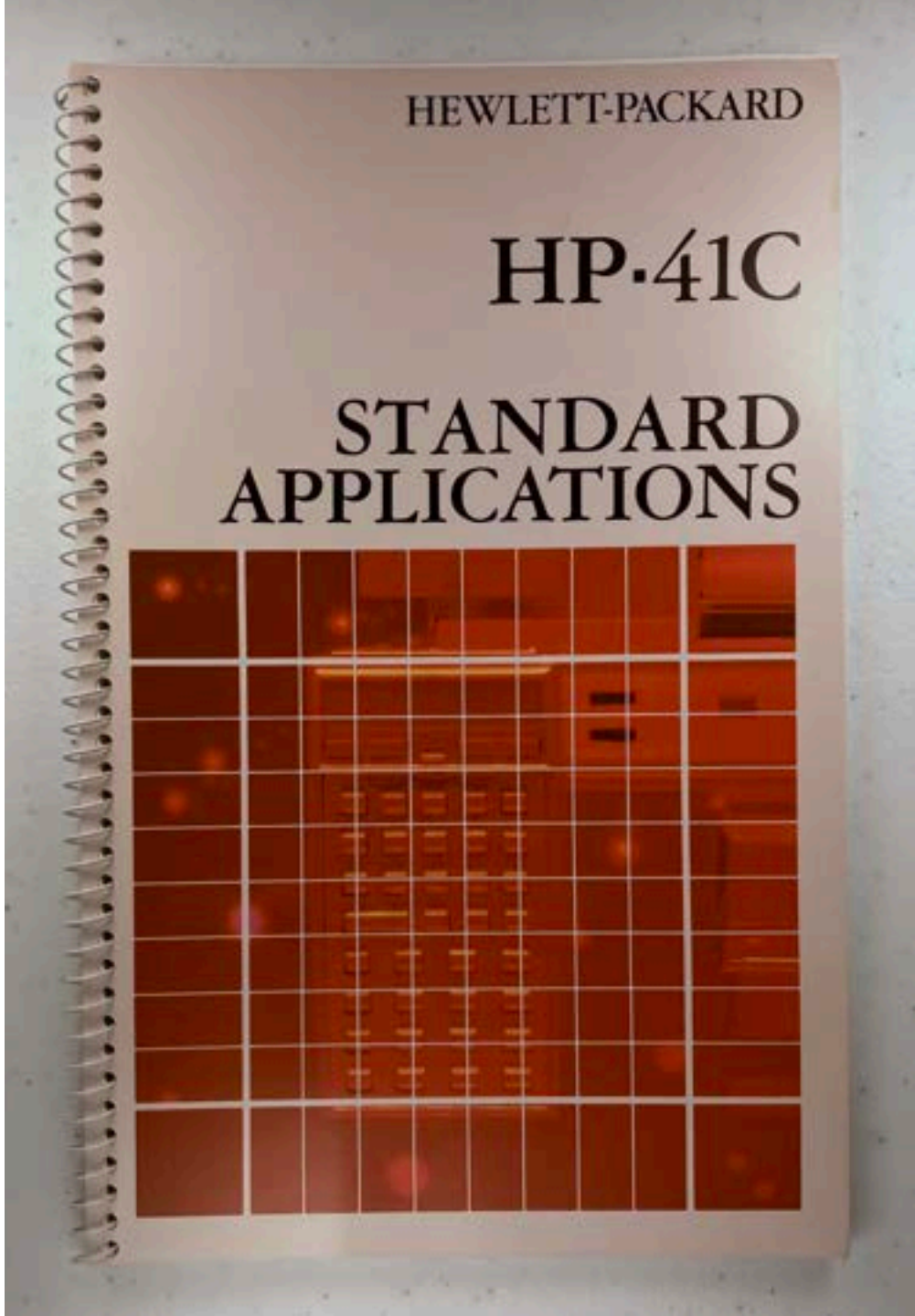


Hewlett-Packard HP-41C Scientific Calculator (1980)

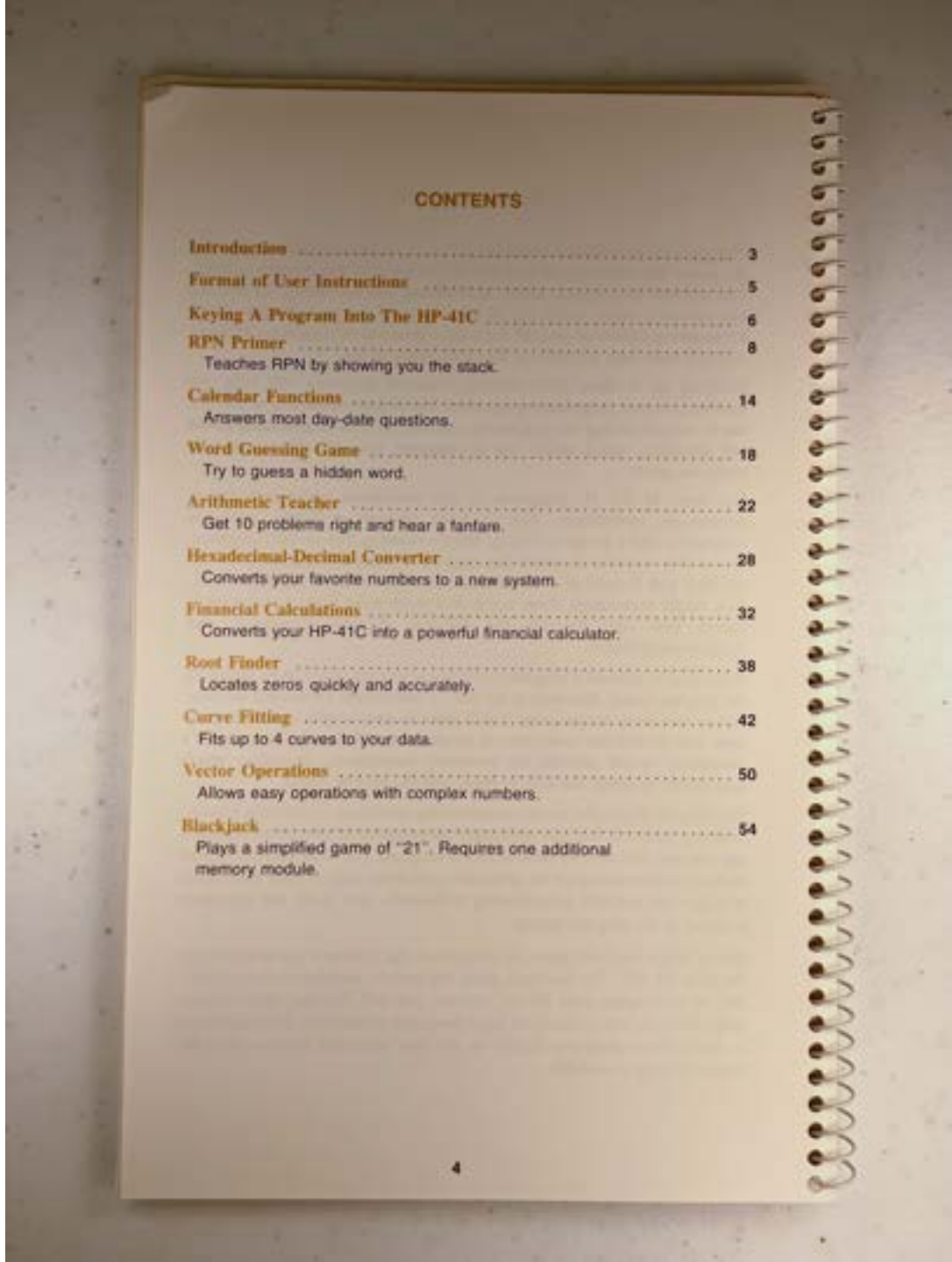
- But even better . . .

Standard Applications



Hewlett-Packard HP-41C Scientific Calculator (1980)

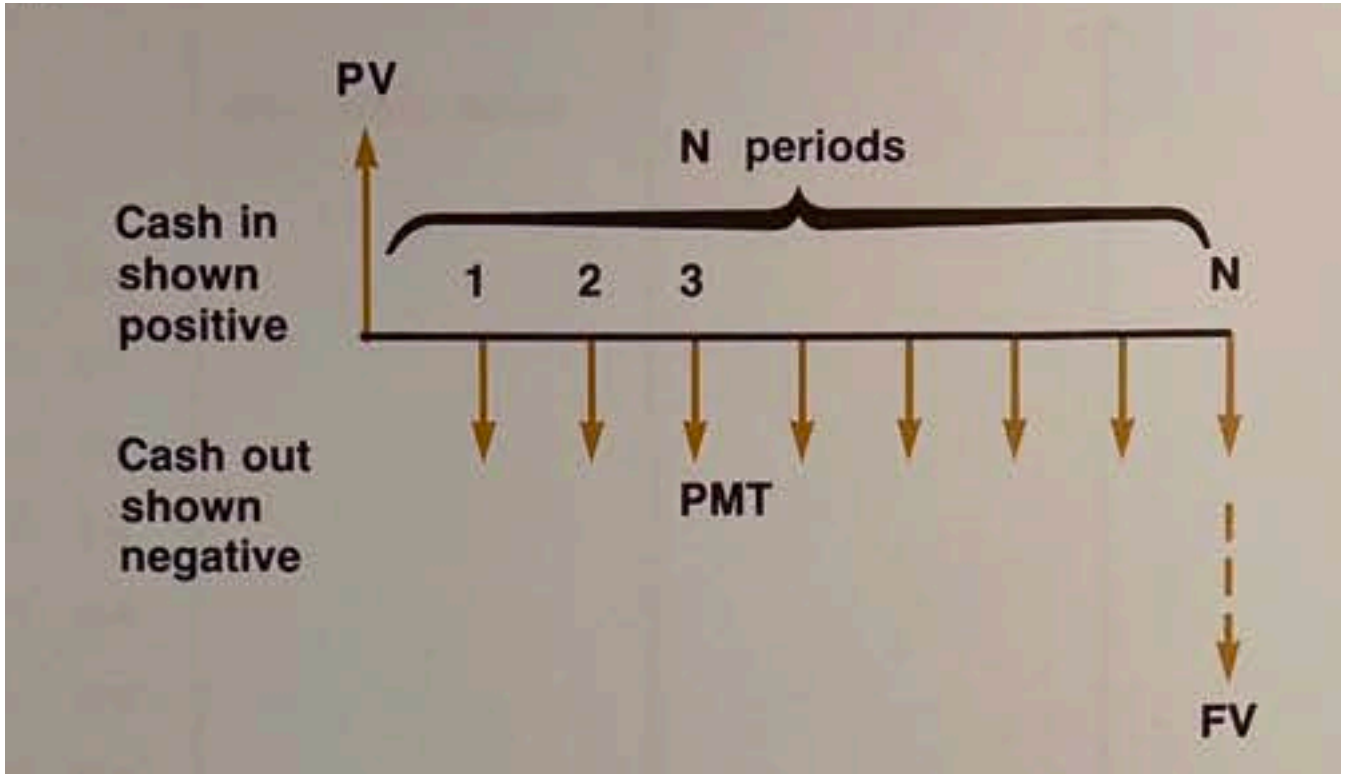
- Exposed to **more** concepts that normally I would not have been exposed to



CONTENTS

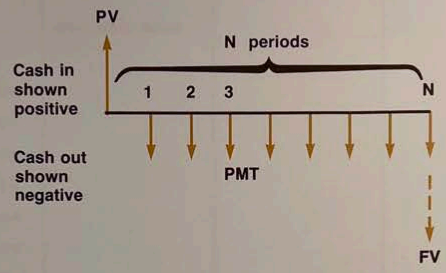
Hewlett-Packard HP-41C Scientific Calculator (1980)

- "Time Value of Money"



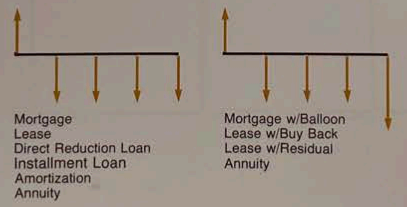
FINANCIAL CALCULATIONS

This program converts your HP-41C into a powerful financial calculator. It has the ability to solve for any of the unknowns relating to a cash flow situation as shown below.



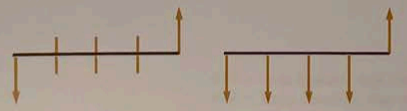
PV = Present Value: the amount loaned, borrowed, invested, etc.
I = Periodic Interest rate.
N = Number of periods.
PMT = Payment amount: the amount paid on a loan or earned on an investment.
FV = Future Value: the amount remaining, accumulated, saved, etc.

The sketch above shows a standard loan amortization cash flow from the borrower's point of view. From the lender's point of view, PV would be shown negative and the PMT stream would be positive. By changing the signs of PV, PMT, and FV, different cash flow situtations may be realized. Cash flow diagrams for the four basic compound interest problems are presented below along with some of the more common terminology.



Mortgage
Lease
Direct Reduction Loan
Installment Loan
Amortization
Annuity

Mortgage w/Balloon
Lease w/Buy Back
Lease w/Residual
Annuity



Compound Growth
Savings Account
Appreciation

Savings Plan
Sinking Fund
Pension Fund
Annuity (series of payments)

Hewlett-Packard HP-41C Scientific Calculator

Schematic!

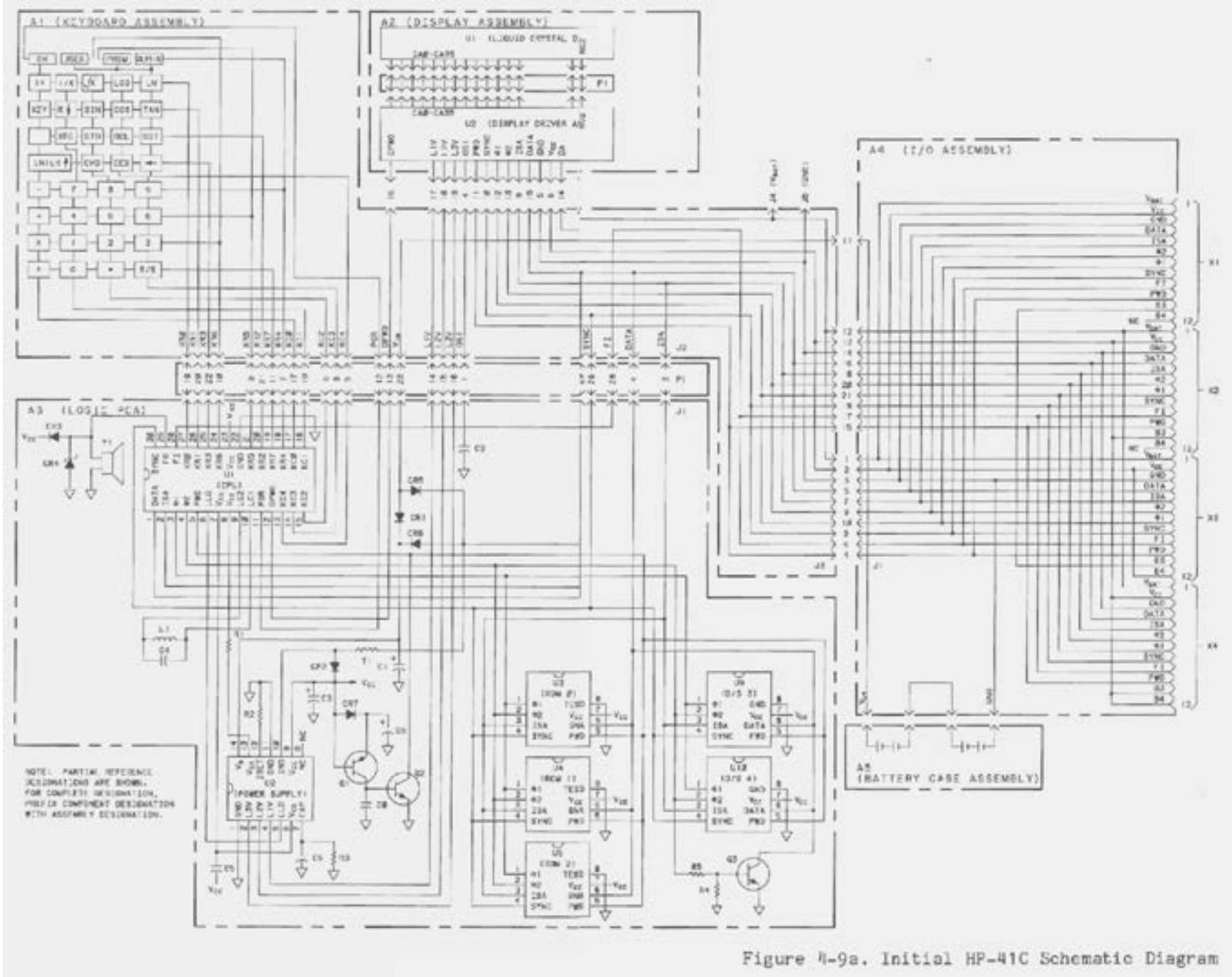
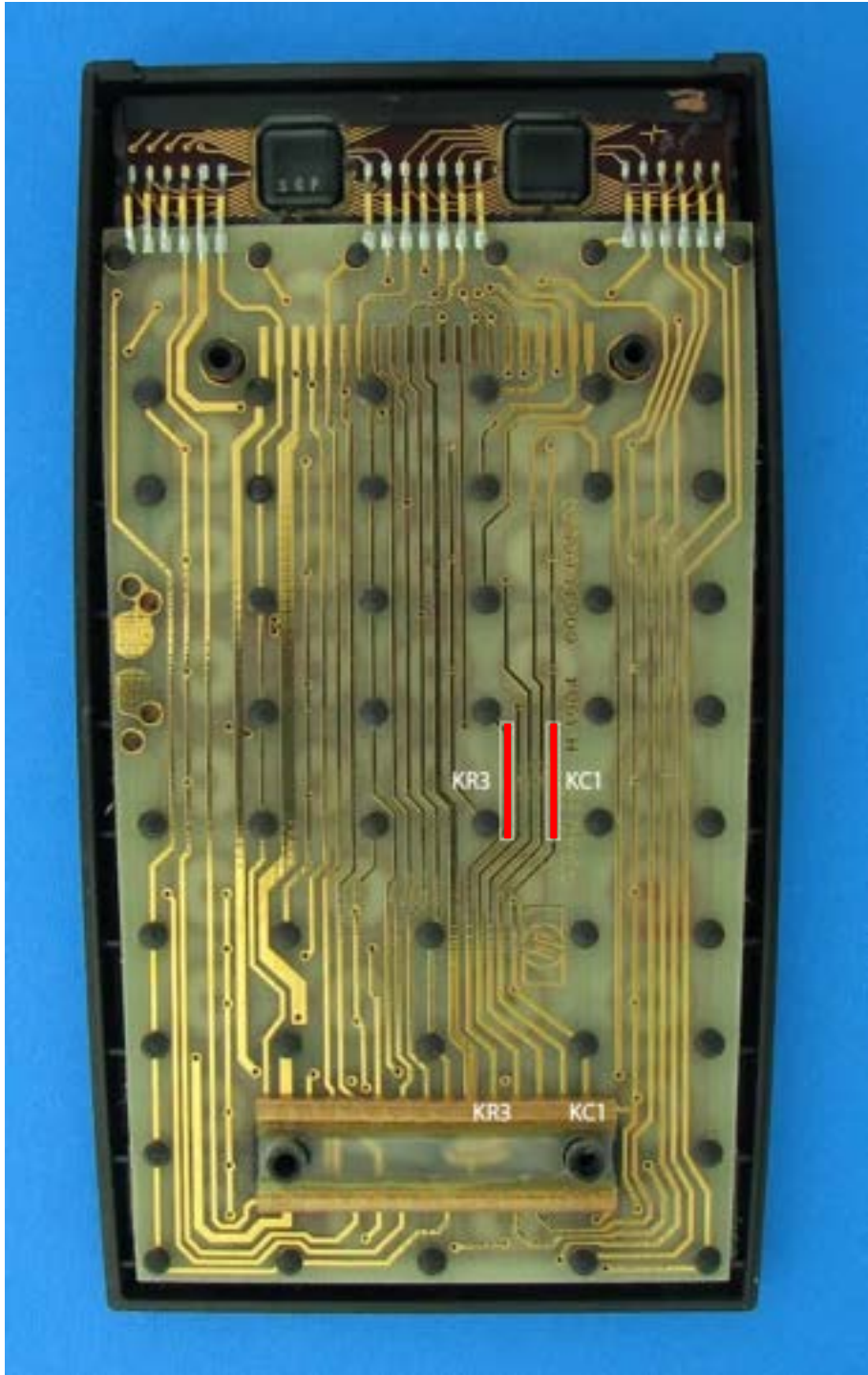


Figure 4-9a. Initial HP-41C Schematic Diagram

Hewlett-Packard HP-41C Scientific Calculator (1980)

- Hack the Calculator
  - Add a button (magnetic reed switch) where a pushbutton really should have been.
- Firmware was robust!
  - I could assign a program to the "phantom" key!



Hewlett-Packard HP-16C Programmer's Calculator (1983)

New calculators to go on sale July 1

By Bill Thompson
Of The Gazette-Times

Two new calculators developed and built by engineers at the Corvallis Division of Hewlett-Packard Co. this year will go on sale worldwide July 1.

"The HP-15C and HP-16C slim-line programmable calculators were introduced this week at the Consumer Electronics Show in Chicago," said Tom Darnall, an HP product spokesman in Corvallis.

"The HP-15C, which sells for $135, is the company's most powerful calculator. It includes an unprecedented number of math, science and engineering functions and will be able to handle complex numbers and a grid of numbers that can be manipulated.

"The HP-16C, which sells for $150, is the first programmable calculator for computer scientists – a highly specialized product aimed at a narrow band of professionals."

Darnall said work on both calculators had been going on for several years and that the Corvallis division will build eight main products, in addition to numerous accessories.

They are the HP-11, 12, 15 and 16 calculators, the HP-41 handheld computer and the HP-80, 85 and 87 personal computers.

"Unlike the HP-15 calculator, I don't think the average person could make much sense of the HP-16C, which is designed for people who work with computer language," Darnall said.

"The HP-16C marks the company's entry into highly specialized calculators, and is seen as one way to retain HP's competitive edge over the Japanese.

"The Japanese have not taken an interest in specialized products up to now, while we have always been one step ahead of them. The company plans to continue to stay ahead, and this gives us an edge on the market."

Eric Evett, software project manager at the Hewlett-Packard's Palo Alto, Calif., headquarters, said the HP-15C would be invaluable for solving systems of linear equations.

"A seven-equation system could take hours to solve with a pencil, paper and conventional calculator," he said, "but it takes only 28 seconds on the HP-15C."


FFFFFFFFF h
hp 16C
SL SR RL RR RLn RRn MASKL MASKR RMD XOR
A B C D E F 7 8 9 ÷
RRC RLCn RRCn #B ABS DBLR DBL÷
x≷(i) x≷I SHOW SB CB B? AND
GSB GTO HEX DEC OCT BIN 4 5 6 ×
ISZ √x 1/x SF CF F? DBL×
(i) I CLEAR PRGM REG PREFIX WINDOW SET COMPL 1'S 2'S UNSGN NOT
R/S SST R↓ x≷y BSP ENTER 1 2 3 −
PSE CLx LSTx x≤y x<0 x>y x>0
WSIZE FLOAT MEM STATUS EEX OR
ON f g STO RCL 0 • CHS +
x≠y x≠0 x=y x=0
HEWLETT·PACKARD

Osborne Executive
8-bit "Luggable" Computer (1983)

- The computer that killed the company
- Less expensive during Chapter 11 bankruptcy protection
- Used to write programs for Berkeley classes

Toshiba T1000SE "Laptop" Computer (1990)

- First personal "laptop" computer
- Best screen!
- Battery-backed SRAM disk for storage

Toshiba T1000SE "Laptop" Computer (1990)

- Battery eventually wore out
- Replaced with RC Car battery taped to the outside

- Didn't look *too much* like Dynamite!

Hewlett-Packard HP-200LX "Palmtop" Computer (1994)

- Computers are getting smaller!
- Last MS-DOS computer that I bought
- At work, engineers didn't have laptops, but I had a "palmtop"!
  - Having a spreadsheet in meetings is valuable.
  - Also had a symbolic-math program.

Timeline

1975
Sears Calc.
$80
$500

1979
HP-29C
$175
$750

1983
Osborne
$1,800
$5,600

1994
HP-200LX
$749
$1,600

1962

1972
Adder
$2.50
$20

1977
R.S.
$20
$100

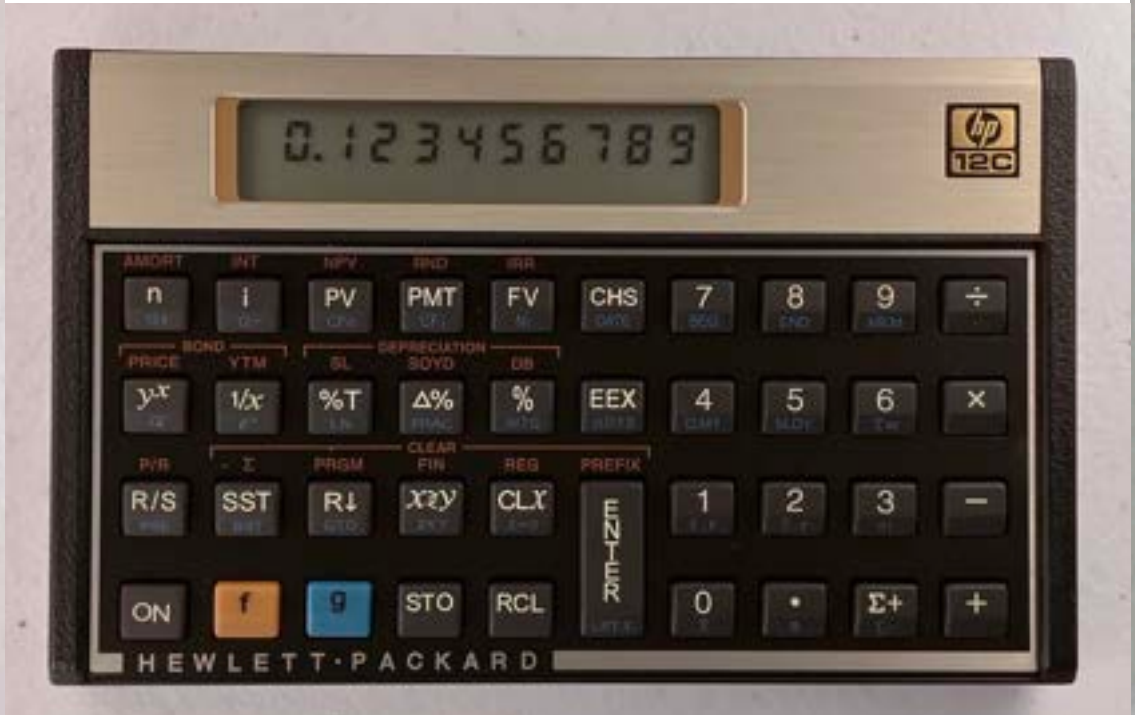
1980
HP-41C
$295
$1,100

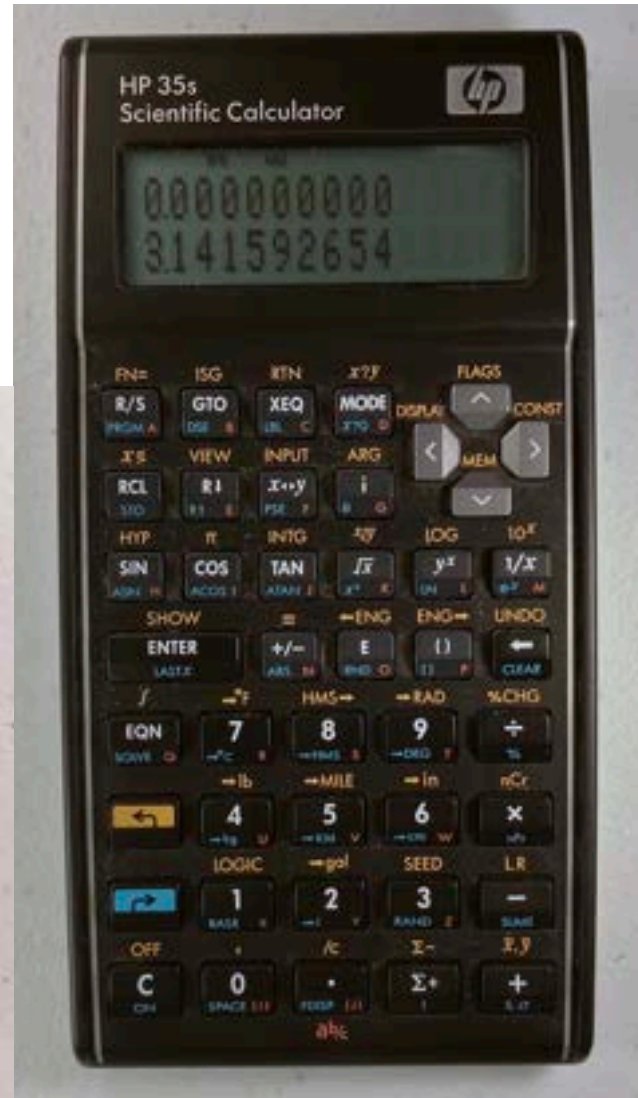
1983
HP-16C
$125
$390

1990
T1000SE
$1,700
$4,100

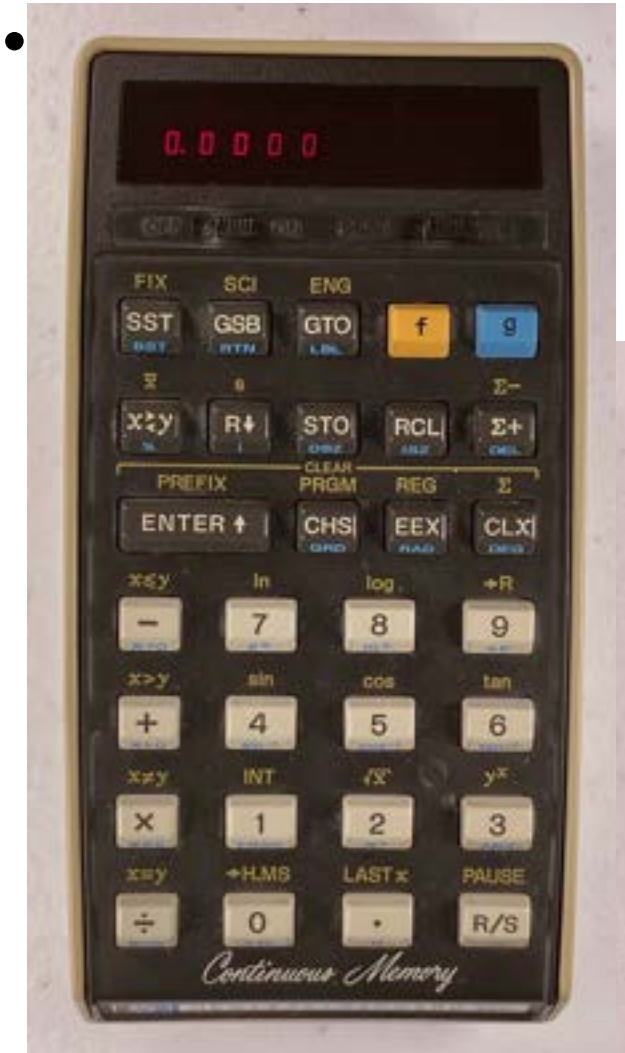
Windows

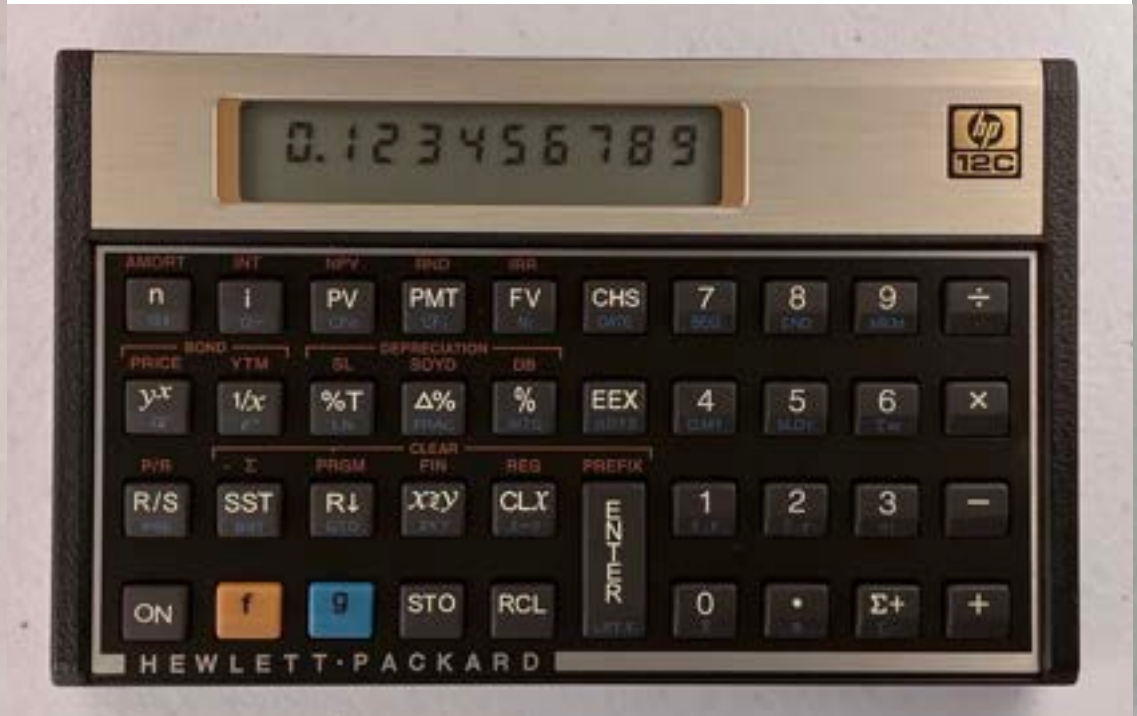
New Purchases: Financial (HP-22, HP-12C) and Retro (HP-35S) Calculators

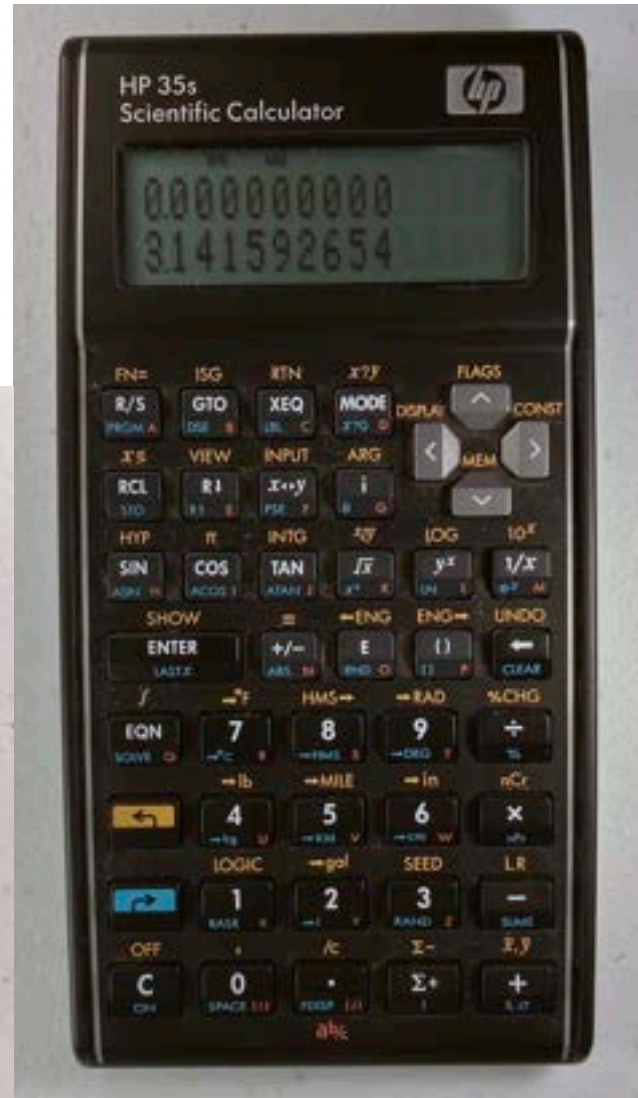




Accessibility Engineering for Color Blindness: Hewlett-Packard HP-29C, HP12C, HP35S

- 

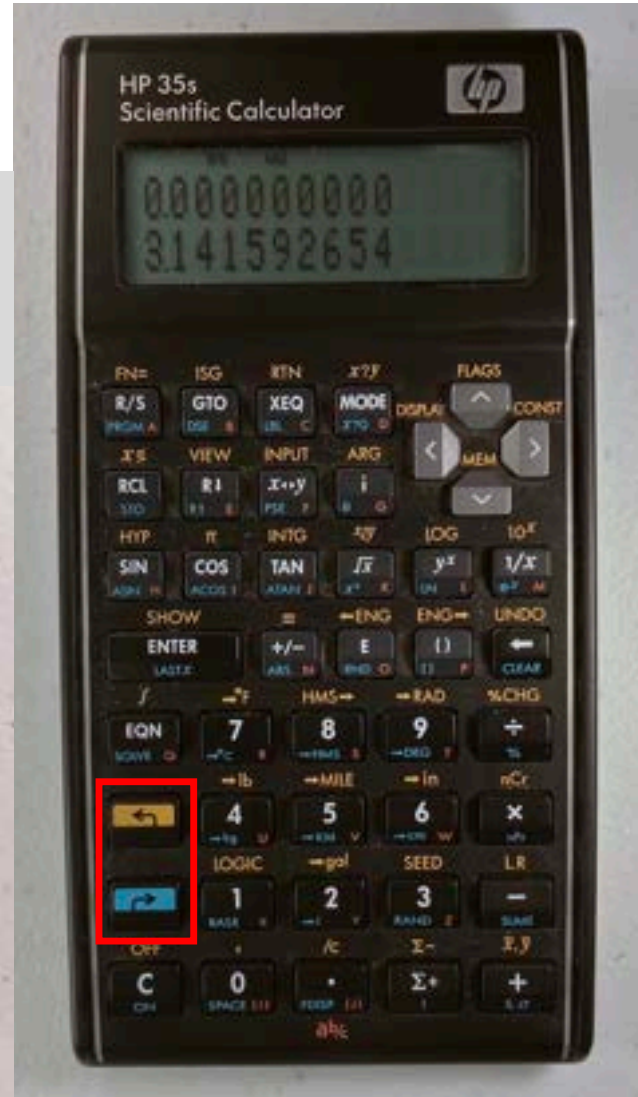




Accessibility Engineering for Color Blindness: Hewlett-Packard HP-29C, HP12C, HP35S

- 

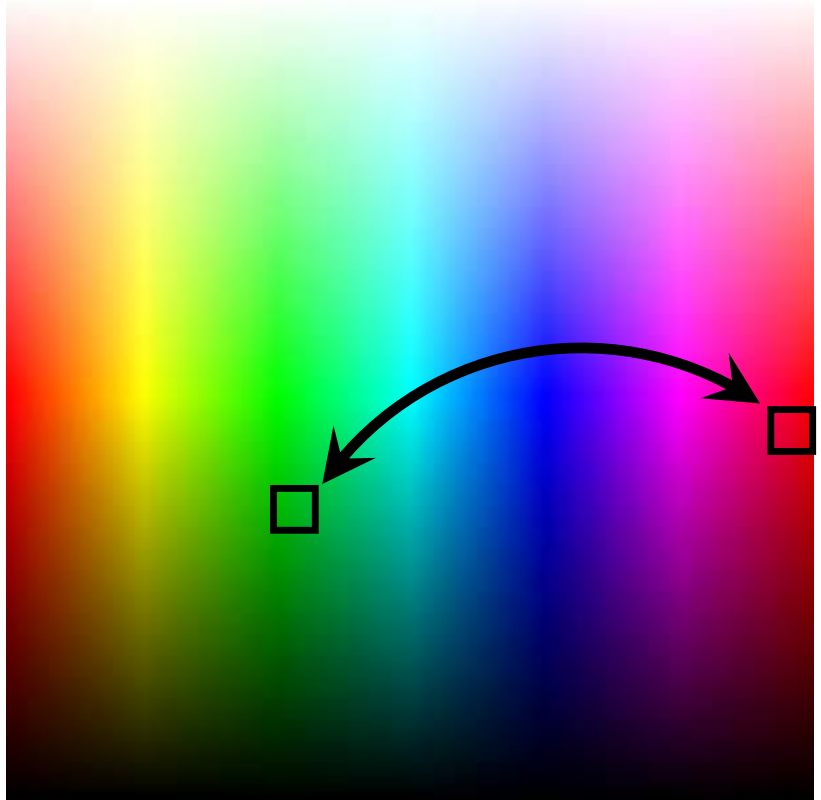
Hewlett-Packard commonly used gold/blue alternate-function keys



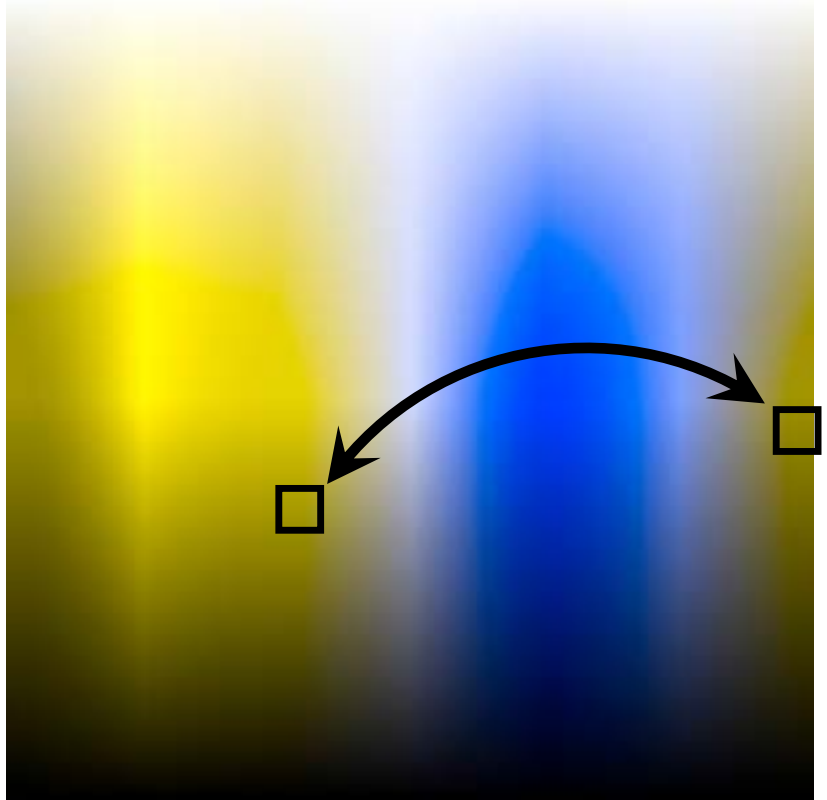
Accessibility Engineering for Color Blindness: Hewlett-Packard HP-29C, HP12C, HP35S

Simulating the Color Confusion of Red/Green Color Blindness

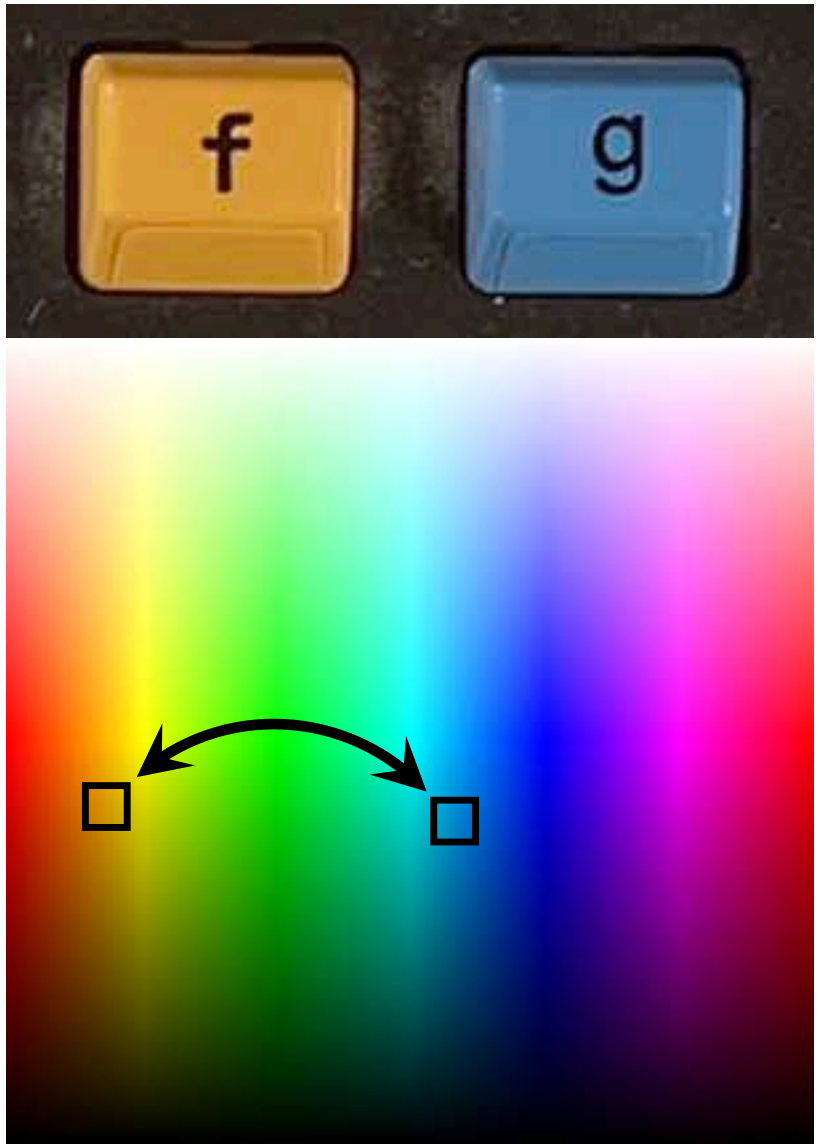
Different Colors as seen by person with Normal Color Vision

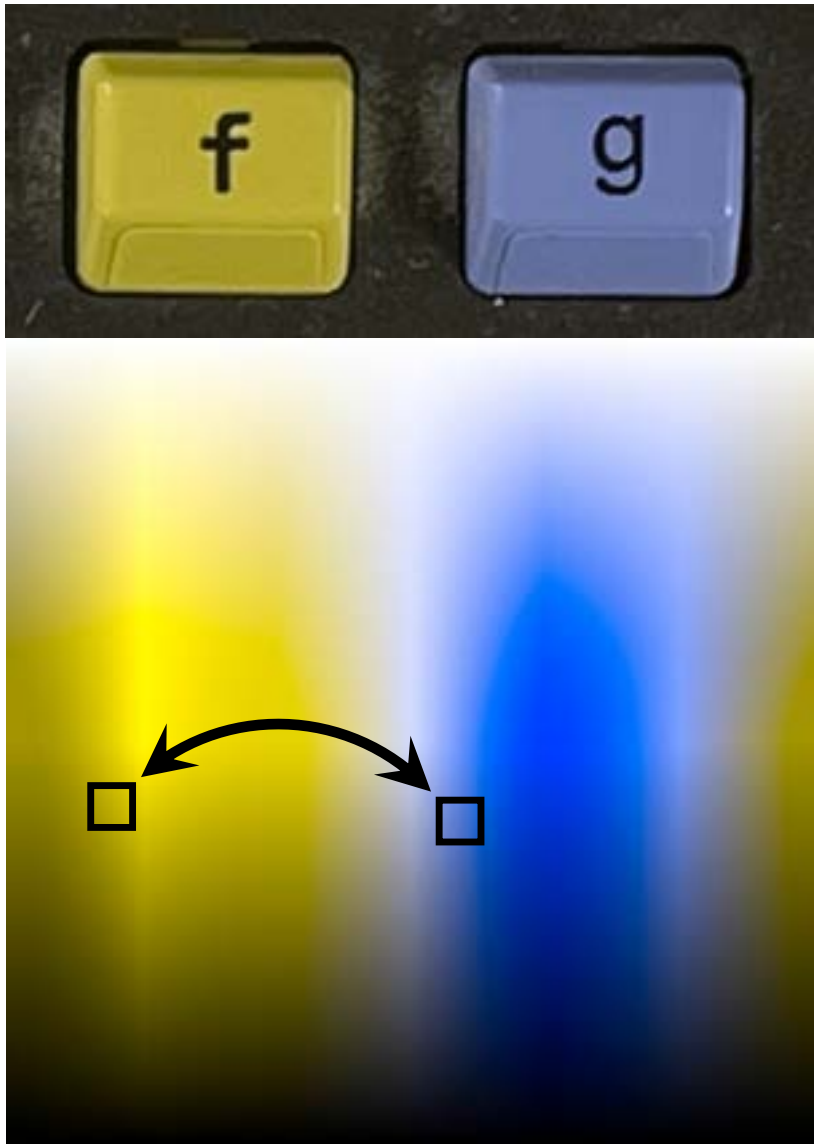


Color Confusion as seen by person with Deuteranopia



Accessibility Engineering for Color Blindness: Hewlett-Packard HP-29C, HP12C, HP35S





Calculators and the Future

- Students use specialized web-site based "calculators"
- Only use physical calculators during paper tests
- Highly capable calculators remain only a curiosity

Apparently "Vintage" now means "What I Once Used"

- Part 1: How Vintage Computing Devices Benefitted Me
- Part 2: The Amazing Curta!
- Part 3: Show and Tell

Kerry Veenstra, K3RRY

Part 2: The Amazing Curta!

- Designed by Curt Herzstark
  - Parents had an adding-machine company in Vienna
  - Herzstark was learning everything needed to take over the business
- WWII!
  - Herzstark already was working on the Curta design
  - SS kept him alive to finish the work and present the calculator to Hitler
  - "He might make you an honorary Aryan!"

Part 2: The Amazing Curta!

- War Ended
  - Franz Joseph II, Prince of Liechtenstein, provided funding for a factory

Part 2: The Amazing Curta!

- My Curta (no. 12440) was made in 1950

Jahr	No.		
1947	901	-	3.000
1948	3.001	-	6.000
1949	6.001	-	9.200
1950	9.201	-	12.600
1951	12.601	-	16.600
1952	16.601	-	20.600
1953	20.601	-	24.400

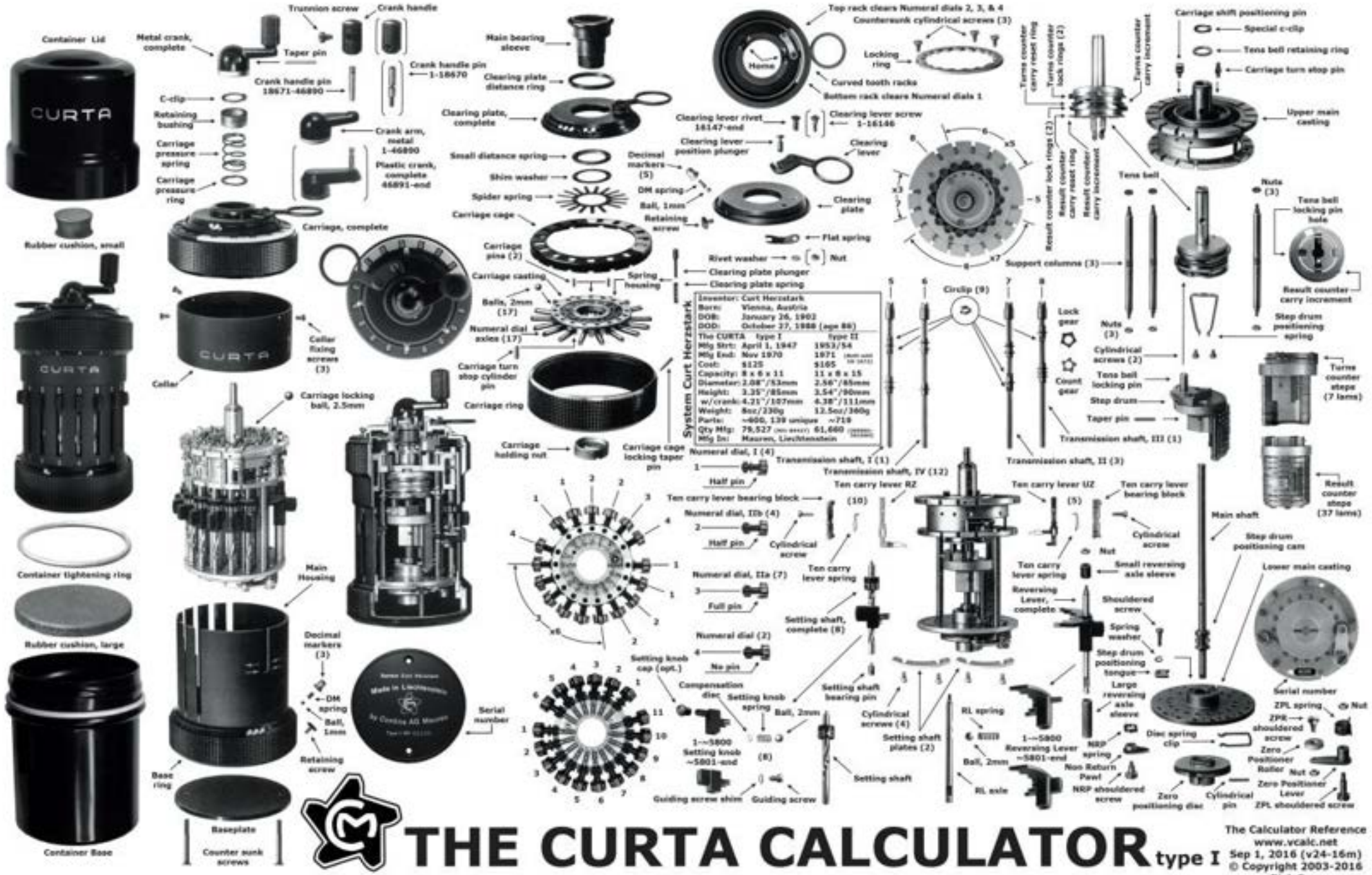
CURTA - RECHENMASCHINE

Modell I u. II

Baujahr mit laufender Nr.

CURTA - SERVICE

600 Parts!



THE CURTA CALCULATOR type I

The Calculator Reference
www.vcalc.net
Sep 1, 2016 (v24-16m)

Demo

- Addition
- Subtraction *!*
- Multiplication *!!*
- Division *!!!*
- Square Roots *!!!!*

Addition

1. Enter a number using side slides
2. Sum into the total on top by turning the crank clockwise once (turn only clockwise)

Subtraction

1. Same as Addition
2. But lift the crank to enter subtraction mode
3. Lower crank to return to addition mode

Multiplication by 1 Digit n

1. To compute $x \times n$ add $x + x + x + x + \ldots + x$, n times
   - Turn the crank n times

```
  123
*   3
-----
  369
```

Multiplication by n Digits

1. Add and Shift

```
      8765
*     1111
      8765
     8765
    8765
   8765
8765
9737915
```

Division

1. Subtract and Shift
2. Use special "reverse" switch to count the number of subtractions positively

Square Root of x (5 significant digits)

1. Enter x
2. Add nearest value from column 1 of table
3. Multiply by value in column 2

- This method was used with traditional multiplying adding machines.

Apparently "Vintage" now means "What I Once Used"

- Part 1: How Vintage Computing Devices Benefitted Me
- Part 2: The Amazing Curta!
- Part 3: Show and Tell

Kerry Veenstra, K3RRY