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$5.50 A YEAR

February 6, 1960

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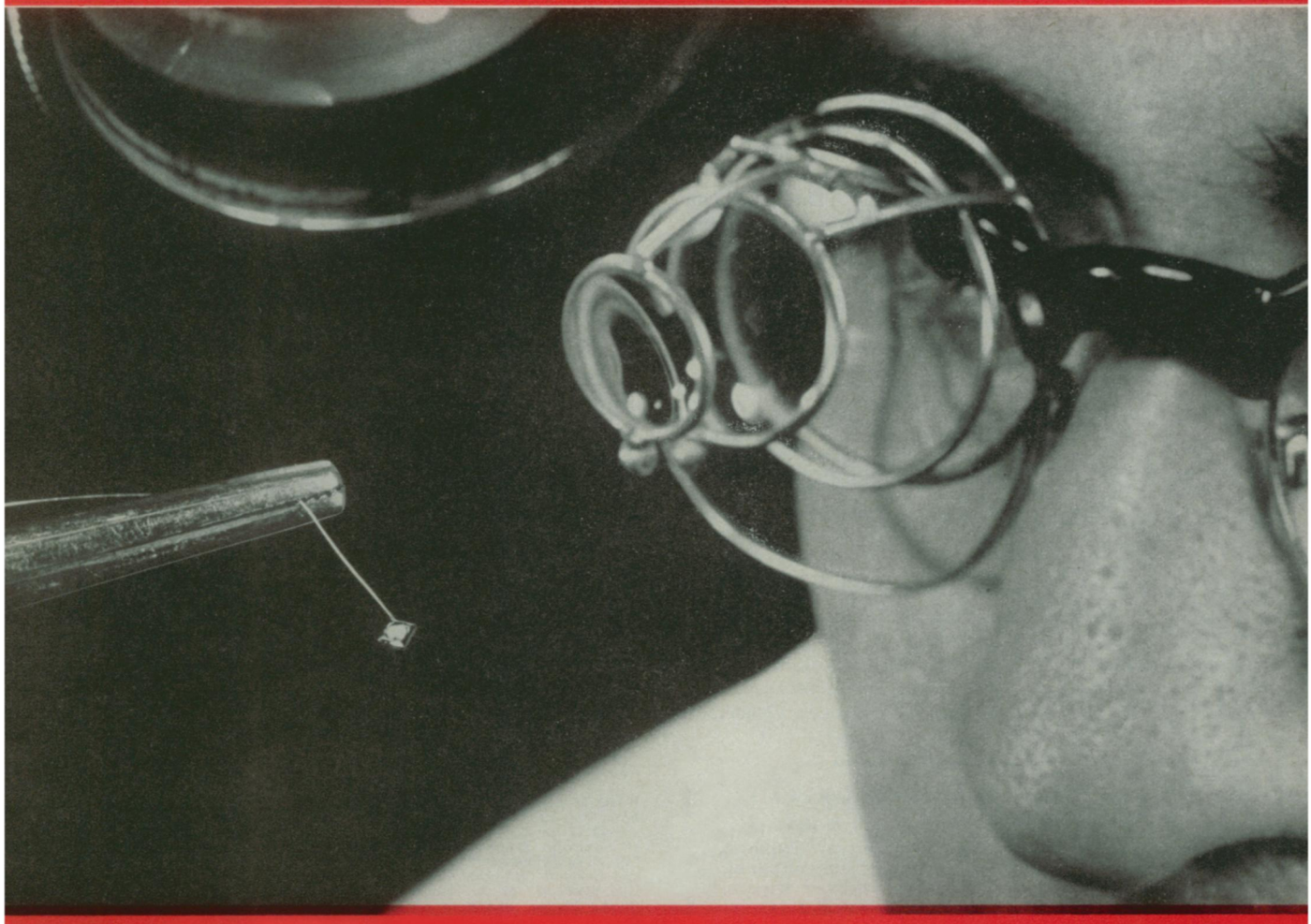
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Radiation Detector

See Page 87

A SCIENCE SERVICE PUBLICATION

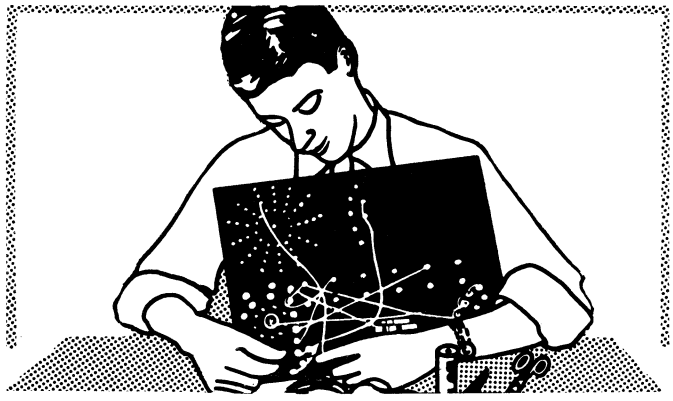
Make over 200 Small Computing and Reasoning Machines with . . .

BRAINIAC®

NEW 1959-60 ELECTRIC BRAIN CONSTRUCTION KIT

EQUALS THE ORIGINAL GENIAC® electric brain construction kit (1955) PLUS many improvements and additions: over 600 parts—including 116 improved patented wipers so that all switches work well. Instead of covering only 33 machines, the BRAINIAC K18 Kit gives full specifications for 201 computing, reasoning, arithmetical, logical, puzzle-solving and game-playing machines . . . all 33 GENIACS (1955), 13 TYNIACS (1956), and 155 BRAINIACS (1957-58-59), etc.

THIS IS BRAINIAC! With our Brainiac Kit K18, you can build over 200 small electric brain machines and toys which "think," compute, reason, and display intelligent behavior. Each one works on a single flashlight battery . . . is FUN to make, FUN to use and play with, and TEACHES you something new about electrical computing and reasoning circuits. All connections with nuts and bolts—no soldering required. Originated by Berkeley Enterprises, the Brainiac K18 kit is the result of 10 years' design and development work with miniature mechanical brains including: Geniac (see "Geniacs: Small Electric Brain Machines and How to Make Them" by Edmund C. Berkeley, 64 pp., published by Geniac Project, a partnership with Oliver Garfield discontinued September 1955), Tyniac (1956), Relay Moe (automatic relay machine playing tit-tat-toe—pictured in Life Magazine, March 19, 1956), Simon (miniature automatic digital computer with 129 relays—see "Simple Simon" by E. C. Berkeley in Scientific American, November 1, 1950), Squee (electronic robot squirrel—see "Light Sensitive Electronic Beast" by E. C. Berkeley in Radio Electronics, December 1951), etc.



WHAT CAN YOU MAKE WITH BRAINIAC KIT K18? Over 200 machines including—LOGIC MACHINES: Syllogism Prover, Intelligence Test, Boolean Algebra Circuits, Douglas MacDonald's Will Analyzer, A Simple Kalin-Burkhart Logical Truth Calculator, Diagnosing Motor Car Trouble, etc. GAME-PLAYING MACHINES: Tit-Tat-Toe, Nim, Wheeled Bandit, Black Match, Sundorra 21, etc. COMPUTERS: To add, subtract, multiply or divide using decimal or binary numbers, Forty-Year Calendar, Prime Number Indicator, Money-Changing Machine, etc. CRYPTOGRAPHIC MACHINES: Coders, Decoders, Lock with 15,000,000 Combinations, etc. PUZZLE-SOLVING MACHINES: The Missionaries and the Cannibals, Age-Guessing Machine, Submarine Rescue Chamber, Daisy Petal Machine, Fox-Hen-Corn & Hired Man, Uranium Space Ship and the Space Pirates, The Three Monkeys Who Spurned Evil, General Alarm at the Fortress of Dreadeerie, etc. QUIZ MACHINE: How to Tell an Aardvark from an Armadillo, The Waxing and the Waning Moon, Polar Air Routes, history, geography, trigonometry, grammar, statistics, calculus, etc.

PROGRAMMING *YOUR OWN* PROBLEMS FOR THE BRAINIAC

The Brainiac is the smallest and lowest-cost semi-automatic, general-purpose digital computer existing. Many problems in ALL fields of knowledge and business can be programmed for the Brainiac—to the extent that a number of versatile multiple switches can express the problem. We shall be glad to program YOUR OWN problems. Write us—no charge for simple problems, modest charge for complicated ones.

WHAT COMES WITH YOUR BRAINIAC K18 KIT—

Complete Plans, Instructions, Explanations & Hardware:

- Every part needed to build Geniacs, Tyniacs, Brainiacs—over 600 pieces including control panel, multiple switch discs, jumpers, improved wipers, bulbs, sockets, washers, wire, battery and special tools.
- Complete descriptions of 201 experiments and machines.
- Over 170 circuit diagrams including 46 exact wiring templates.
- Manual "Brainiacs—Small Electric Brain Machines—Introduction and Explanation" by Edmund C. Berkeley, 1959.
- "Introduction to Boolean Algebra for Circuits and Switching" by Edmund C. Berkeley.
- "How to Go from Brainiacs and Geniacs to Automatic Computers" by Edmund C. Berkeley.
- List of references to computer literature including "Minds and Machines" by W. Sluckin, published by Penguin Books (Baltimore), 1954, 233 pages, and other references.

only $18.95 . . . MORE VALUE • MORE FEATURES

WHO IS EDMUND C. BERKELEY? Author of *Giant Brains or Machines That Think*, Wiley, 1949, 270 pp. (15,000 copies sold); Author of *Computers: Their Operation and Applications*, Reinhold, 1956, 366 pp.; Author of *Symbolic Logic and Intelligent Machines*, Reinhold, 1959, 203 pp.; Editor & Publisher of the magazine, *Computers and Automation;* Maker and Developer of small robots; Fellow of the Society of Actuaries; Secretary (1947-53) of the Association for Computing Machinery; Designer of all the Tyniacs and Brainiacs, more than half of the 33 Geniacs (1955); Designer of the patented Multiple Switch Disc and other features in the 1955 Geniac kit.

BRAINIAC KIT (1959-60 MODEL) K18 . . . the kit with limitless possibilities—backed by an organization of 12 years standing in the computer field—$18.95. (For shipment west of Mississippi, add 80¢; outside U.S., add $1.80.)

7-Day Full Refund Guarantee If Not Satisfactory

MAIL THIS COUPON OR A COPY OF IT

BERKELEY ENTERPRISES, Inc.
815 Washington St., R213, Newtonville 60, Mass.

Please send me Brainiac Kit K18. (Returnable in 7 days for full refund if not satisfactory—if in good condition.) I enclose $_____ in full payment.

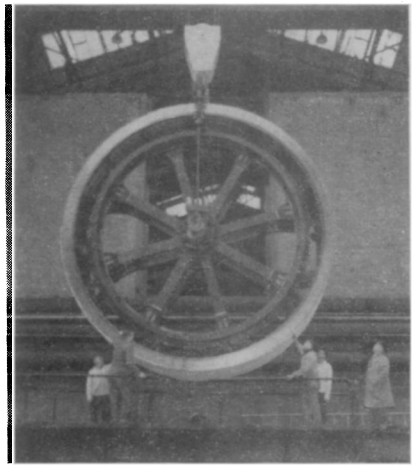
My name and address are attached

Kodak reports on:

what the big wheels do . . . the differing demands of art and photographic utility . . . film for photographing a tiny little speck in a great big sky

A kind word for triacetate tape

We make base for magnetic tape. Our base is cellulose triacetate, the same as in Kodak Aerographic Films for precision mapping from aloft. We cast it from solution on the nigh miraculously smooth peripheries of 18-foot wheels like this one. In the 330° of rotation



allotted for preliminary evaporation of the solvents before stripping off as sheet, the thickness—along with any thickness errors—shrinks by 4/5. Except for infrequent replating, these prodigious wheels have been rotating with stately unbroken angular momentum night and day, winter and summer, weekends and workdays for a full generation of mortal man.

Not only do our tape-making customers rival each other in excellence of deposition, but our cellulose triacetate has a rival of its own in polyethylene terephthalate, which is known as polyester. Because of the slightly higher price of polyester tape, it has often been assumed on all counts superior. This misconception hurts us.* The price difference at least partially stems from the higher salable yield that the tape manufacturer gets from cellulose triacetate. He has to reject less tape for deformation or "skew" and has the inherent thickness uniformity of the solvent-evaporation method to thank.

Though most of the tape being bought today is our beloved cellulose triacetate, there is a place for polyester. That we admit. It's very good for humidity amplitude and devilishly strong.

Cellulose triacetate, on the other hand, has only 15% ultimate residual elongation, not 45%. It does not go on stretching and stretching when overloaded by apparatus design that leans too heavily on strength of the tape base. In many applications a stretch of large and unknown magnitude could have a sneaky effect on the results.

One other factor puts cellulose triacetate high with the man to whom the word "dropout" is an expression of horror. A dropout is caused by an inhomogeneity. Our cellulose triacetate, by the nature of its manufacture, is not likely to contribute inhomogeneity. Believe us.

Don't write to us about the foregoing unless you just happen to be in a mood for correspondence. All we ask is that you bear our assertions in mind when the occasion arises to specify magnetic recording tape.

*Another thing that disturbs us is inclusion of cellulose triacetate under the generic term "acetate." Fortunately, cellulose *di*acetate is fast disappearing from the tape market.

A Retina in front of your own

This, in our current and patently prejudiced view, is the best camera that money can buy, $199.50 worth of money, to be specific.

This is the camera we recommend for the scientific worker who does not especially enjoy photography for its own sake but has decided to deprive himself no longer of its benefits to his work.

This camera is very handy for recording facts as they occur, under the widest variety of conditions and with the least thought to technicalities, least of all to the tiresome question of parallax. Even at only 5⅞″ film-to-subject distance, made possible by the supplementary lenses for closeups, the exact scene falling on the user's own retina as he presses the button will shortly be a 35mm color slide for projection. He sees the scene through the camera lens itself at its full aperture, with a split-image rangefinder view at the center of the ground glass. He can make pictures as fast as he can flip the lever, real pictures for which opportunity may have come rapidly, not just a succession of wasteful trial shots that grope for some usable combination of camera pointing, focus, and exposure. Judgment and arithmetic in choosing proper exposure are replaced by the act of bringing two pointers into coincidence, one of them being photoelectrically actuated.

This camera, its wide-angle lenses, its telephoto lenses, and its specialized photo aids (such as for adapting to a microscope) all come from Kodak A. G. in Stuttgart, a plant devoted to the Retina system of photography. They make the taking of good photographs easy. Great photographs are another matter. Great photographs convey universal emotion and are works of art. A great and talented artist may not need a *Kodak Retina Reflex S Camera*, but neither does a *Kodak Retina Reflex S Camera* need a great and talented artist.

They are still a little scarce at the camera shops. Please don't be angry if you have to come back a second time.

"Shellburst"—ask for that by name

Until now we have spent very little on advertising *Kodak Linagraph Shellburst Film.* Therefore the inquirer to whom we recommend it for speed, fine grain, high contrast, and sharpness gets the satisfaction of having been tipped off on something special. The antique, oddly militant name "Shellburst" sticks in the mind. The hydrogen bubble chamber people, for instance, have taken to it.

Now we announce an upward shove in the performance of this brand of 16mm, 35mm, and 70mm film for photographing a tiny little speck in a great big sky. The spectral sensitivity peak has been shifted from 650mμ to 680mμ. This decision was reached at the cost of a vast number of man-hours, not only in the laboratory but out on deserts and hazy hillsides. In the course of these labors, good optical reasons turned up for peaking at 680mμ instead of pushing out to the infrared.

Along with the extension of red sensitivity, the new *Shellburst* has been endowed with (2) half again as much speed for the same graininess, (3) a significant improvement in acutance that is particularly prominent at high densities, and (4) a hardening of the emulsion to permit speedy hot processing.

For processing recommendations and the names of dealers, write Eastman Kodak Company, Photorecording Methods Division, Rochester 4, N. Y.

Price is list and subject to change without notice.

Kodak
TRADEMARK

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science