

electronics

A McGRÁW-HILL PUBLICATION

FEBRUARY • 1956

FEB 3 1956

CHECKING SHOES FOR MISPLACED TACKS—Inspection of shoe insoles for protruding metal is speeded at E. W. Wright & Co. factory by using detector developed by United Shoe Machinery engineers (see p 144) . COVER

H. W. MATEER, *Publisher*

W. W. MacDONALD, *Editor*

VIN ZELUFF, *Managing Editor*

JOHN MARKUS, *Associate Editor*

ALEXANDER A. MCKENZIE, *Associate Editor*

JOHN M. CARROLL, *Associate Editor*

WILLIAM P. O'BRIEN, *Assistant Editor*

WILLIAM G. ARNOLD, *Assistant Editor*

DAVID A. FINDLAY, *Assistant Editor*

HAIG A. MANOOGIAN, *Assistant Editor*

GLORIA J. FILIPPONE, *Editorial Assistant*

ARLENE SCHILP, *Editorial Assistant*

FRANCES SULLIVAN, *Editorial Assistant*

CAROLE A. MORRIS, *Editorial Assistant*

GLADYS T. MONTGOMERY, *Washington Editor*

HARRY PHILLIPS, *Art Director*

SHOPTALK 2

FIGURES OF THE MONTH 6

INDUSTRY REPORT 7

Government Outlines Spending	7	New Models Ready For '56	20
SAGE Readies Sunday Punch	7	Will Sun Spots Boost Sales?	20
Shield Receivers, FCC Warns	8	TV Stations Equip For Color	22
Industry's Future Grows Brighter	8	Small-Boat Electronics	22
Transistors Progress	10	Equipment Emphasizes Batteries	22
Scatter Circuit Authorized	12	Transmitter Antenna Sales Up	24
Research And Development Gains	12	Conelrad Extends Radio Blackout	24
F-M Stations Take On New Business	12	Selenium Shortage May Be Eased	24
Magnetic Recording Sales Rise	14	Financial Roundup	26
TV Networks Swing To Microwave	14	Marines Land Radar	26
Germanium Rectifiers Save Space	16	Future Meetings	26
Automatic Production Makes Jobs	16	Industry Shorts	26
Finance Firms Take To Electronics	20		

CROSSTALK 121

WALLACE B. BLOOD, *Manager*

R. S. QUINT, *Buyers' Guide Manager*

FRANK H. WARD, *Business Manager*

GEORGE E. POMEROY, *Classified Manager*

DONALD H. MILLER, *New York*

JAMES GIRDWOOD, *New York*

WM. S. HODGKINSON, *New England*

JAMES T. HAUPTLI, *Philadelphia*

CHARLES WARDNER, *Chicago*

BRUCE WINNER, *Chicago*

HENRY M. SHAW, *Cleveland*

T. H. CARMODY, *San Francisco*

R. C. ALCORN, *San Francisco*

CARL W. DYSINGER, *Los Angeles*

WM. D. LANIER, *Atlanta*

JAMES H. CASH, *Dallas*

KEITH HENNEY, *Consultant*

FEATURES

Electronic Controls for Machine Tools 122

By David A. Findlay

Broadband Antenna for Field-Intensity Meters 130

By Edward N. Singer and Herschel R. Caler

Character Recognition for Business Machines 132

By M. H. Glauberman

Diffusion Transistors Raise Frequency Limits 137

By John M. Carroll

Magnetic Amplifier Two-Speed Servo System 140

By Joseph John Suozzi

Tack Detector for Shoe Production 144

By Robert W. Bradley

Airborne Weather Radar Uses Isoecho Circuit 147

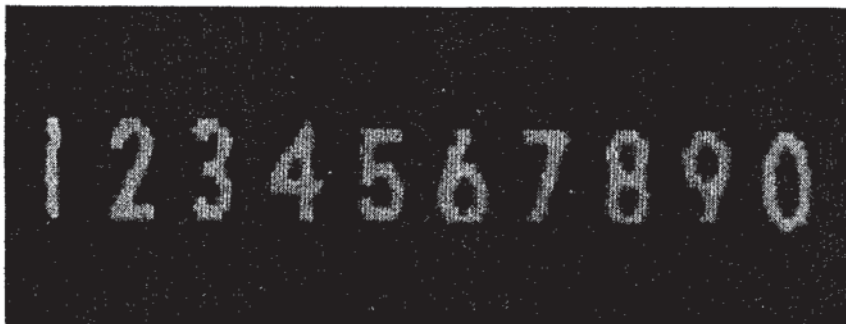
By F. W. Ruppert and J. M. Smith

Automatic Measurement of Voltage Tolerances 150

By A. J. Strassman

Character Recognition

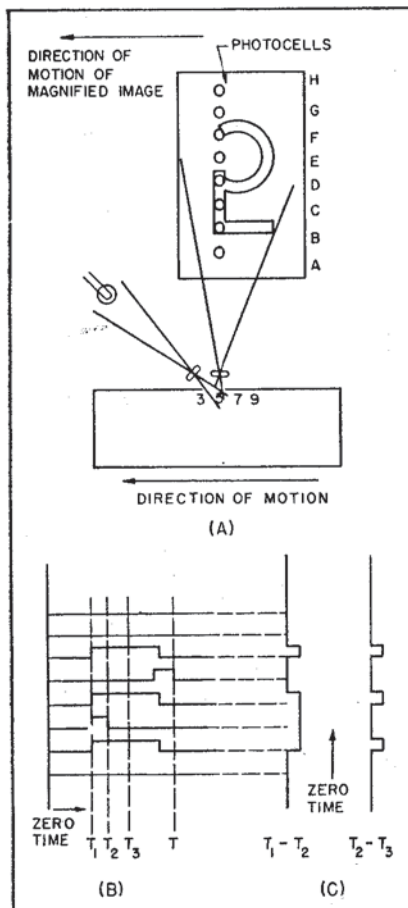
SUMMARY — Photoelectric scanner analyzes printed numerals and provides electrical output usable in computers and other business machines. Reader recognizes 400 characters per second. Operation is independent of type style or size of number above minimum width



Numerals printed by character reader

By M. H. GLAUBERMAN

Senior Engineer
Laboratory for Electronics, Inc.
Boston, Massachusetts



THIS READER recognizes Arabic numerals as printed matter passes through it.

Paper is not restricted as to color, thickness, opacity, roughness or quality. Ink need have no special qualities. The depth of the impression on the paper is of no significance, and at no time does the reader come into contact with the paper.

The character reader cannot read all type styles, but is not dependent on any one style. Minimum type width is approximately $\frac{1}{8}$ in. for the widest digit. There is no restriction on maximum type width. The reader is not dependent on the height of the type providing the size is not larger than the aperture of the reading station. A common type height is about $\frac{1}{8}$ inch. Most print imperfections will not impair recognition.

With checks moving into the reader at 16 per second, it recognizes 400 characters per second. The reader is able to read 1,600 characters per second, however, and could be made to operate at twice

serially and sorts by successive passes.

Photoelectric Scanner

The scanner consists of a column of photocells whose outputs are modulated by the black portions of characters. The photocells are sequentially gated into a common buffer. Figure 1A shows how a magnified image of a number is projected on the photocells. Figure 2 shows the scanner circuits.

Figure 1B shows the photocell outputs. The effect of sequentially gating the outputs into a common buffer is shown in Fig. 1C.

Table I—Pulse-Code Combination

Total Pulses Per Scan	Long-Black Pulses Per Scan	Coded Combination
1	0	10
1	1	11
2	0	20
2	1	21\21'
2	2	22
3	0	30\30'
3	1	31

Note that the first digit of the coded combination represents the total number of black pulses per scan and the second digit represents

formed in the G_m gates, there is nothing to put into storage.

Readiness for interrogation is detected in buffer B , which is connected to the seventh and last stage of storage. The first signal at the output of B , passes through gate G , and generates a gate whose duration is $1\frac{1}{2}$ scan periods. This gate connected to B_n enables the register to advance on the next system trigger.

Subsequent signals at the output of B , during the character storage time are prevented from passing through gate G , by the $1\frac{1}{2}$ -character-period gate generator, the latter

being energized by the system trigger that occurs after the first output signal at B_n . This particular system trigger is broadened in the matrix interrogation-pulse generator and is then used in the diode matrix.

Shift Register Storage

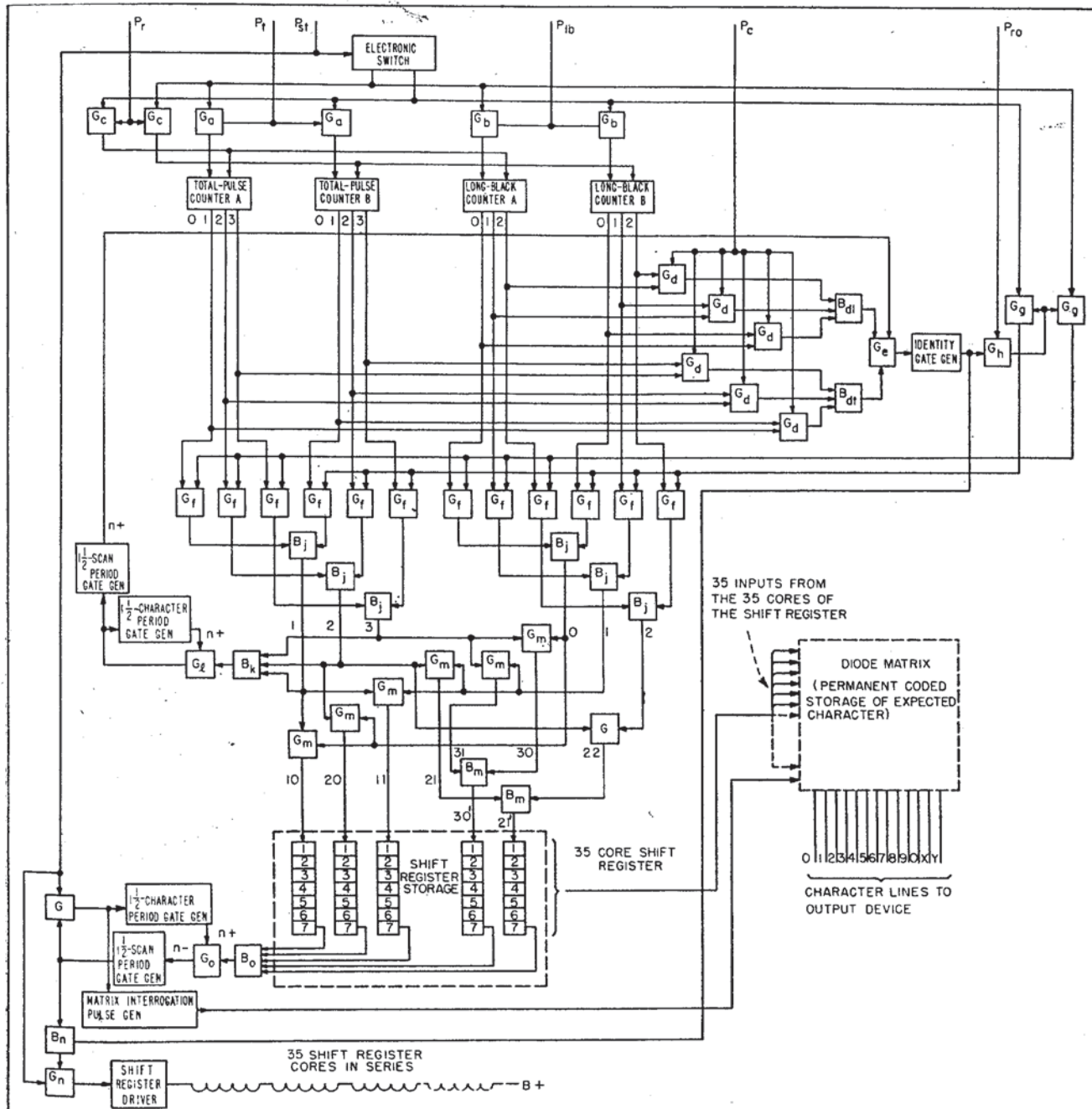
Each block in Fig. 6A represents one magnetic core. There are thirty-five cores arranged in five columns of seven each. Each of the five columns is used to store one of the five discrete code combinations.

Information is always read into row 1 and remains in row 1 until

a shift signal is applied whereupon the content of row 1 is advanced to row 2.

Access to the information in the cores is available only during the shift-pulse time. As indicated in Fig. 6A, a single shift signal suffices to advance all thirty-five cores.

Figure 6B shows the scanned character THREE. The total number of pulses T in scan one is one. There are no long pulses L (code 10). For scan two: $T = 2, L = 0$ for code 20. Scans three, four and five also yield code 20. In scans six and seven, $T = 3, L = 0$ for code 30. Scan eight contains only one long pulse



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.