

NEWS BRIEFS

● ATLANTIC COAST LINE has installed a Servo Corp., system that centralizes control of 12 remote, unattended hotbox detectors in CTC territory between Manchester and Waycross, Ga. One carrier frequency feeds in information from all detectors to the CTC dispatcher's office, where data is printed out on a graphic recorder. Train information is stored on magnetic tape at each detector site. If a hotbox actuates the alarm computer, a lamp is lighted on the console to alert the dispatcher. After stopping the train, the dispatcher can call the reporting detector using a step in his CTC machine control code, to receive a print out on his recorder. ACL now has 38 hotbox detectors in service on 5,500 miles of lines.

● BALTIMORE & OHIO has received ICC permission to install traffic control between and in the vicinity of Eidenau and West Penn Crossing, Pa., about 20 miles.

B&O is installing a traffic control

system between Willard, Ohio and Pine Jct., Ill., \$3,928,360, about 75% complete. System train radio on the Monongahela division in West Virginia, costing \$1,800,000 is 90% complete. Projects for next year, also reported to *Railway Age*, include the following: Expansion of train radio—\$1,400,000; hotbox detectors—\$500,000; radio controlled signaling—\$500,000; automatic highway grade crossing protection at Akron, Ohio—\$200,000; and Wheel Checkers—\$100,000.

● BOSTON & MAINE plans to install CTC between Lowell and Lowell Jct., Mass., at a cost of \$241,000. Also reported to *Railway Age* for 1965 are plans to install automatic highway grade crossing protection equipment at several locations, the estimated total cost to be \$245,000.

● CANADIAN PACIFIC has ordered CTC equipment from General Railway Signal Co., to be installed between Revelstoke and

Golden, B.C., 60 miles. The type J system will be controlled from a Traffic Master machine at Revelstoke.

CP also ordered CTC equipment from GRS for installation between Brandon and Portage la Prairie, Man., 80 miles. Control will be from a Traffic Master machine at Brandon.

● CHESAPEAKE & OHIO construction projects for 1964 included: TCC control machine installed in new yard office at Peru, Ind., \$277,100; CTC Ivy to Staunton, Va., \$475,000, 60% complete; replace leased teletype circuits with railroad-owned circuits, \$397,500, 97% complete; and install mainline base radio stations between Hinton, W.Va., and Russell, Ky., \$101,610, 60% complete.

Projects for 1965, as reported to *Railway Age*, include: interlocking and track changes at Saginaw, Mich., \$119,000; interlocking and hotbox detectors at Lynchburg, Va., \$163,000; additional propane switch heaters at various locations, \$200,000.

● CHICAGO & EASTERN ILLINOIS has purchased three hotbox detectors from Servo Corp.

● CHICAGO & NORTH WESTERN has purchased equipment from Servo Corp., for the remote detection of heat radiated by carloads of hot pelletized iron ore. The new system is in operation at the railroad's Escanaba, Mich., ore dock. An infrared radiation pyrometer mounted atop a 35-ft pole next to the scale house views the tops of the pelletized ore cars as they pass by for weighing. An amplifier, chart recorder and alarm unit inside the scale house work with the pyrometer to alert personnel of overheated ore cars. Each car wheel—in connection with the scale operation—is identified by an event marker pen on the chart. Car position and car count are quickly determined from the analog pen record of relative heat radiated from the hot pelletized ore car.

C&NW has ordered a low-speed directional highway grade crossing control system from Servo Corp.

● CHICAGO, BURLINGTON &

This Was News 50 and 25 Years Ago

The *Signal Engineer*, January 1915. Panama Railroad installs vitrified clay multiple duct for housing telephone, telegraph and signal cables from Colon to Panama.—Delaware, Lackawanna & Western has finished a steel tower, 402 ft high, at Hoboken, N.J., as a part of its wireless telegraph equipment. The Hoboken office now has a 5 kw Marconi apparatus, and messages have been sent from Hoboken to Buffalo, 410 miles. The wave length is 2,250 meters.—Canadian Pacific has several short installations of electric train staff equipment. They have 21 staff blocks, comprising in all 46 staff instruments.—Chicago, Burlington & Quincy has installed 112 miles of automatic block signaling, using the Burlington's standard absolute permissive circuits. It was installed on single track: Denver to Akron, Colo. Protection is from siding-to-siding for opposing moves, but only

block to block for following moves, and when the direction of traffic is once established, train movements can be made with the same despatch as on lines where traffic is always in the same direction.

Railway Signaling, January 1940. Wabash testmen inspect relays and test insulation resistance and ground resistance, as well as make general inspections of signaling. In order to minimize "book work" required of maintainers, one type of form serves for reporting all of the tests or inspections made by maintainers which must be kept on file in the supervisors' offices to meet the requirements of the ICC.—Pennsylvania has extensive organization, methods and instructions pertaining to testing, inspection and maintenance of signals in accordance with ICC rules, standards and instructions which became effective September 1, 1939. **RS&C**

(Please turn to page 26)

NEWS BRIEFS

(Continued from page 10)

QUINCY has purchased six hotbox detectors from Servo Corp.

CB&Q is installing dispatcher control two-way radio communications equipment with improved waystation dispatcher amplifiers and facilities for local radio control at selected locations. As reported to *Railway Age*, these additions in 1964 are costing \$142,440, and the project is 40% complete. The CTC installation between Aurora and Galesburg, Ill., is 10% complete, and is estimated to cost \$1,508,804.

● CLINCHFIELD has purchased two hotbox detectors from Servo Corp.

● COMMUNICATION & SIGNAL SECTION, AAR will hold its 1965 annual meeting at the Sheraton-Cleveland Hotel in Cleveland, Ohio on Monday through Wednesday, September 13-15.

● CYBERNETICS: According to a recent article in *Railway Age*, (Dec. 14, 1964, page 25), two railroads are applying cybernetics (computer usage) for simulating communication network requirements and six railroads are planning to do so. In the area of message switching computer application, three railroads reported planning to make such usage. In other areas of signaling and communications no specific topics were mentioned but it is known that at least two railroads are using CTC simulation techniques for planning sidings locations in proposed CTC territories, and another railroad has used a computer to calculate transposition bracket locations for pole lines.

● DELAWARE & HUDSON will install CTC between North Albany and Colonie, N.Y. With completion of this section and another section of CTC at the north end of the railroad, the entire D&H mainline will be under CTC operation, controlled from the Albany general office building. The road also plans to install additional hotbox detectors and dragging equipment detectors in 1965.

● GULF, MOBILE & OHIO is

planning to install a traffic control system on 18 miles of line between Plainview and Wann, Ill., costing \$300,000. The project will release 12 miles of second main track.

● ILLINOIS CENTRAL has received ICC approval to modify an electric interlocking protecting the Green River drawbridge at Rockport, Ky., to change from manual to automatic operation (*RS&C Oct. 1964, page 77*).

In reporting to *Railway Age* on projects carried out during 1964, IC included the following: install CTC East St. Louis to DuQuoin, Ill., and retire 40 miles of second main track and nine miles of sidings and yard tracks, \$1,200,000, complete; East St. Louis—revise "B" yard and install new retarders, \$2,300,000, 95% complete; install CTC Gilman to Homewood, Ill., retire 21 miles of third and fourth main track and six miles of yard tracks and sidings, \$1,000,000, 75% complete.

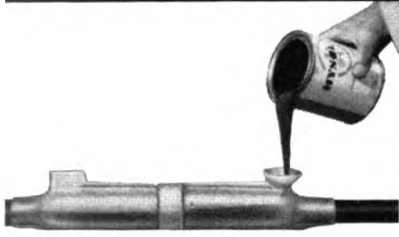
● LEHIGH VALLEY is single tracking and remote controlling its mainline between Sayre, Pa., and Manchester, N.Y., \$1,000,000, 60% complete in 1964. For 1965, LV plans to spend \$165,000 installing automatic highway grade crossing protection equipment at several locations.

● LOUISVILLE & NASHVILLE reported to *Railway Age* that the following projects are planned for 1965: install CTC Corbin to Winchester, Ky., \$1,700,000, 85% complete; extension and adding a group retarder at Tilford yard, Atlanta, \$750,000, 95% complete; install three bidirectional and three unidirectional hotbox detectors on the Mobile division, \$240,000, 10% complete; replace a pair of line wires between Louisville, Ky., and Evansville, Ind., and install a pair of wires between Evansville and East St. Louis, Ill. (all wires are to be transposed for 150 kc); install carrier for voice and data transmission, \$228,000. Equip remaining road locomotives with radio and install yard radio systems at East St. Louis, Ill., Howell, Ga., Pascagoula, Miss., and Cartersville, Ga. This project includes providing radio for MofW flagging using portable units

(Please turn to page 28)

NEW HYSEAL™ SPLICE PROTECTION

FAST, ECONOMICAL,
ATTRACTIVE



EPOXY SPLICE KITS for Solid Encapsulation of Splices

- eliminates air voids with patented vents
- assures cable centering with patented centering wafers
- self-sealing tapered ends eliminate taping
- foolproof epoxy mixing system



COMMUNICATION SPLICE CASES for Positive Protection with Quick, Easy Re-entry

- in-line, single and double branch cases
- one case fits many cable sizes
- built-in seal eliminates grommets
- pressure, non-pressure, aerial or underground



CABLE BUTT SPLICE CASES Fast, Economical, Attractive, Easy Re-entry

- replaces unsightly taped splices
- saves hours of labor
- prevents cable damage from cutting old fashioned taped splices
- keeps splices clean and dry



HYSOL EPOXI-PATCH KITS For Bonding, Sealing and Repairing Most Materials

- easy to use
- 100% solids — no solvents, no fire hazard

A PRODUCT OF

HYSOL

Olean, New York / Los Angeles, California
Toronto, Canada / London, England

Distributed by

GraybaR

ELECTRIC COMPANY, INC.

(Continued from page 26)

and repeater stations. Cost is set at \$922,894. Plans also include providing portable radio equipment for yard and branch line switchmen, and install point-to-train radio stations on Chattanooga and Nashville divisions, \$350,000.

● **THE MILWAUKEE ROAD** has purchased a low-speed, directional highway grade crossing control system from Servo Corp.

● **MISSOURI PACIFIC** projects for 1965 include replacing old radio equipment with new transistorized radios, according to a report made to *Railway Age*.

MP has received ICC approval for installation of a traffic control system on one track between Alexandria, La., and Higgins, Ark., and extension of present CTC from East Little Rock, Ark., to Higgins, a total distance of about 289 miles. Control will be from a machine at Little Rock, Ark.

● **NEW YORK CENTRAL** is planning to spend \$107,000 in 1965 on automatic highway grade crossing protection equipment to be installed at Miamisburg, Ohio. Also, for 1965, NYC plans to install CTC between Dunkirk and Dunbridge, Ohio, \$430,000; and equip 125 locomotives with radio and install wayside radio base stations, \$690,000.

NYC has installed 8 Grade Crossing Predictors in Bellefontaine, Ohio and 4 in Sharonville. In addition to these units, the railroad has purchased 8 GCPs from Marquardt Corp., for installation at Terre Haute, Ind.

● **NORFOLK & WESTERN** has purchased two hotbox detectors from Servo Corp.

Projects under way in 1964 included installation of signaling for double running on eastbound and westbound tracks between Hull and Matewan W.Va., and TCS between Wharnccliffe and Gilbert, W.Va., \$1,007,200, 30% complete; install CTC Columbus to Sandusky, Ohio, \$1,810,000, 1% complete.

N&W projects for 1965, as re-

ported to *Railway Age*, include the following: install communications circuits Bluefield, W.Va., to Columbus, Ohio, \$150,000; install communications circuits, hotbox detectors and wayside radio stations, Columbus to Sandusky, \$114,000; rebuild pole line for 16 miles between Shinrock and Bellevue, Ohio, \$119,950.

● **NORTHERN PACIFIC** reports to *Railway Age* that it is planning to spend \$232,000 for CTC between Frenchtown and Missoula, Mont.; and install CTC between Paradise, Mont., and Sandpoint, Idaho, 119 miles, \$2,250,000.

NP has ordered 4 GCP units from Marquardt Corp., for installation at Missoula, Mont.

● **PACIFIC ELECTRIC** has installed 2 electronic track circuits at La Habra, Calif. Equipment was purchased from the Marquardt Corp. PE has ordered 13 additional electronic track circuits and 3 GCP units for use in the Los Angeles area.

● **PENNSYLVANIA** and Pennsylvania-Reading Seashore Lines have received ICC approval to install traffic control, interlockings, rear-range automatic cab signal systems, modify automatic block signaling and interlockings and discontinue certain other automatic block signaling and interlocking systems from Camden and Delair to West Haddonfield, N.J., on the PRR, and from Camden and West Haddonfield to Kirkwood on the PRSL, totaling 14.6 miles. This project is in connection with construction of South Jersey High Speed Transit Line and North-South Freeway.

PRR plans for 1965 include installation of speed sensing retarders at Colehour, Ind., Toledo, Ohio, Terre Haute, Ind., Rose Lake, Ill., and Indianapolis, Ind., with total costs amounting to \$1,033,750.

● **READING** plans to spend \$151,600 for automatic highway grade crossing protection equipment to be installed at Bridgeport, Pa., in 1965.

RDG has ordered 12 GCP units from Marquardt Corp., for installation at highway grade crossings in Bridgeport, Pa.

● **SANTA FE** has purchased 11 hotbox detectors from Servo Corp. (Please turn to page 34)



For your best connection...

ARMADILLO FIBERGLASS BUILDINGS

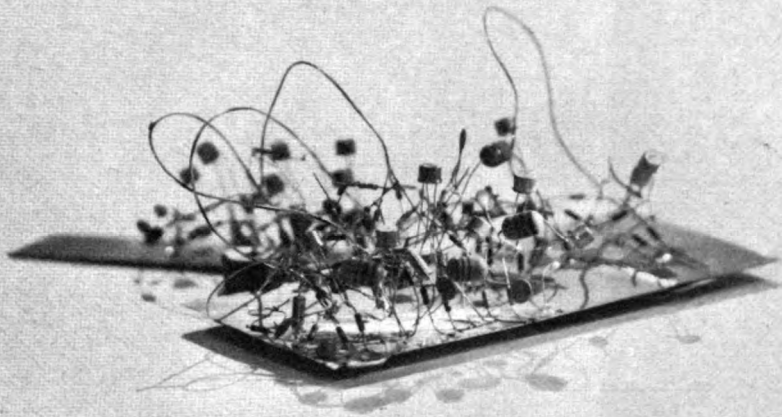


- VHF STATION
- TELEPHONE BOOTH
- SIGNAL EQUIPMENT HOUSING
- CONTROL EQUIPMENT HOUSING
- HOT BOX DETECTION BUILDING
- METER HOUSE
- MICROWAVE REPEATER BUILDING
- CALORIMETER BUILDING
- INSTRUMENT SHELTER
- BEACON CONTROL HOUSING
- MISCELLANEOUS USES

FEATURES: Non Oxidizing • Seamless • Non Porous • Superior Insulation • More Durable • Portable • Structurally Stable • Less Maintenance

ARMADILLO MFG. CO. • 847 E. COLFAX AVE. • DENVER, COLO.

This is Kebby's Inspired Creation



We've seen wackier art win critics' acclaim—but frankly, we're just too darn busy to call in the judges.

Then too, Kebby engineers are more interested in meeting communication performance objectives more economically—more efficiently—than in winning laurels.

Take the latest bit of "sculpture" above. It's actually a forerunner of the KMC-21—a new class of equipment which radically changes all the parameters of microwave costs.

To do this, Kebby engineers have developed a number of remarkable advances that others still ponder—"tubeless klystrons," stripline filters, surprisingly efficient varactor multipliers, to name a few. Ingenious stuff, really. Beautifully packaged, totally solid-state equipment. Although it wasn't designed to win art prizes—it is bound to give you a new outlook on microwave communications. That's why we suggest that Kebby Microwave is the company to remember when:

1. You are considering a new microwave installation;
2. You are upgrading existing communications systems;
3. Or when you must cut costs, reduce maintenance, or improve channel capacity.

For details write:

kmc KEBBY MICROWAVE CORPORATION
535 Old County Rd., San Carlos, Calif., (415) 593-1616 TWX 415-594-8893

NEWS BRIEFS

(Continued from page 28)

AT&SF plans to complete its mainline microwave system in 1965 by installing systems between Amarillo, Texas and Winslow, Ariz. (work now underway), and between Topeka, Kan., and Chicago, Ill. This will give AT&SF a microwave system from Chicago to Los Angeles, Calif. Additional installations of traffic control systems and radio equipment are also planned for 1965.

● SEABOARD AIR LINE has ordered 56 sets of Link FSD1-A presence detectors from Western Railroad Supply Co. The units will be installed at Hamlet, N.C., automatic retarder classification yard to provide for automatic handling of extra-length cars.

● ST. LOUIS-SAN FRANCISCO has received ICC approval to install traffic control system on single track between Thayer, Mo., and Turrell, Ark., 122 miles. Control is to be from a machine at Springfield, Mo.

● ST. LOUIS SOUTHWESTERN has purchased two hotbox detectors from Servo Corp.

● SOUTHERN PACIFIC has purchased seven hotbox detectors from Servo Corp.

During 1964, SP ordered 170 highway grade crossing control units from Marquardt Corp., most of them were installed in California and Oregon.

● TERMINAL RAILROAD ASSOCIATION of ST. LOUIS has installed 4 GCP highway-grade crossing protection control units in St. Louis, Mo. The equipment was purchased from the Marquardt Corp.

● TEXAS & PACIFIC plans to install a system-wide direct distance dialing telephone network in 1965.

● TORONTO, HAMILTON & BUFFALO has ordered 4 Grade Crossing Predictor units from Marquardt Corp., for installation at Hamilton, Ont.

● UNION PACIFIC has purchased

17 hotbox detectors from Servo Corp.

UP construction plans for 1965, according to a report to *Railway Age*, include: install a microwave system between Pocatello, Ida., and Huntington, Ore., \$854,868; install microwave between Huntington and Hinkle, Ore., \$450,456; and install an all-electric NX route interlocking at Omaha, Neb., to control traffic between the Missouri river bridge and Gilmore involving the consolidation of six interlockings.

UP now has microwave in service on 1,811 miles route miles between Omaha, Neb., and Los Angeles, Calif. The road will have more than 2,700 route miles in service when the above-mentioned links are completed. In addition to Omaha-Los Angeles, UP will have microwave from Salt Lake City, Utah to Portland, Ore.

Railroad Personnel

● **ATLANTIC COAST LINE:** J. M. Altman is appointed assistant supervisor communication and signaling with headquarters at Tampa, Fla. J. B. Wainwright, supervisor of signals, Sanford, Fla., has retired.

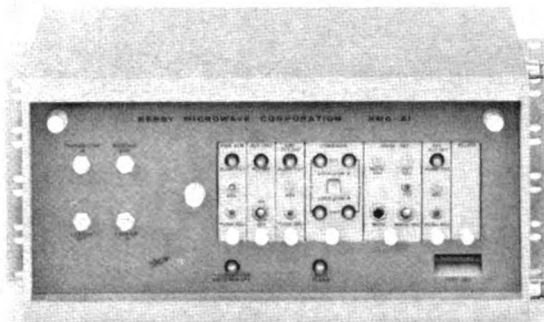
● **ALASKA RAILROAD:** J. R. Nichols has been appointed chief communications officer succeeding F. W. Shellhorn, retired.

● **COMMUNICATION & SIGNAL SECTION, AAR:** George McCann, assistant secretary is appointed secretary succeeding Andrew H. Grothmann, deceased (RS&C Nov. 1964, page 44).

● **CANADIAN NATIONAL:** H. Raymond Beck, engineer of signals, Montreal, has been appointed railway telecommunications project manager. He is to coordinate and head up a year-long, study of CN's railway operating communications. P. G. O'Malley, assistant signal engineer, Toronto, has been appointed acting signal engineer there succeeding Donald H. Green, transferred to system headquarters at Montreal.

Mr. Beck was born in Winnipeg, Man., Sept. 21, 1925. He graduated from the University of Manitoba in 1947 with a bachelor of science in electrical engineering degree. He
(Please turn to page 37)

This is Kebby's 2 kmc Terminal



The KMC-21 is an entirely new class of equipment which changes all the cost parameters of microwave communications.

The KMC-21 is a complete microwave transmitter-receiver which provides one full watt RF output yet requires only 15 watts of primary power. Allows never-before freedom in site selection.

And because the KMC-21 is a totally solid-state device, reliability is remarkably improved while maintenance is minimized.

What's more, unique linear modulation technique reduces intermodulation distortion and noise, permits more channels (over 300) with acceptable performance than is possible with other all-solid-state equipment. In fact, limitation on channel capacity is not in the equipment—which can handle 600 channels or more—but in current frequency allocations. Video capability available soon.

Optional tunnel diode RF preamplifier permits smaller, less costly antennas—allows longer, more economical hops—or provides greater fade margins—because receiver noise figure, including diplexer loss, is reduced to 6 db or less.

For new KMC-21 brochure write:

kmc KEBBY MICROWAVE CORPORATION
535 Old County Rd., San Carlos, Calif., (415) 593-1616 TWX 415-594-8893

NEWS BRIEFS

(Continued from page 35)

joined CN in Toronto as an assistant engineer in 1949. He was granted a leave of absence in 1952 to accept an Athlone Fellowship at Imperial College, London, England, from which he received a DIC degree. He returned to CN at Toronto in 1954 as assistant signal engineer. Three years later he was appointed assistant signal engineer, system, with headquarters at Montreal. From 1958 to 1960, Mr. Beck was acting signal engineer, system, and in 1960 he was promoted to engineer of signals for the system at Montreal.

● **CANADIAN NATIONAL TELECOMMUNICATIONS:** **Anthony J. Kuhr**, sales and operations superintendent, eastern region, has been appointed chief of sales and traffic services at system headquarters in Toronto. He succeeds **David H. Hawley**, retired.

Mr. Kuhr joined CNT in 1936, and after wartime service was appointed training supervisor at Montreal in 1951. Three years later he was appointed commercial supervisor for the Quebec district. In 1957, Mr. Kuhr was promoted to manager of CNT at Montreal.



H. Raymond Beck



Anthony J. Kuhr

● **KANSAS CITY SOUTHERN:** **C. F. Grundy**, signal engineer, has retired after 38 years of service.

● **SOUTHERN:** **James T. Hudson**, general communications engineer (RS&C Oct. 1964, page 78), was born in Columbia, S.C., June 4, 1921. He graduated from the University of South Carolina in 1949 with a BSEE degree. He joined the Southern that year as a telephone maintainer, and two years later was promoted to general foreman of
(Please turn to page 38)



Positive Switch Operation in Any Weather!

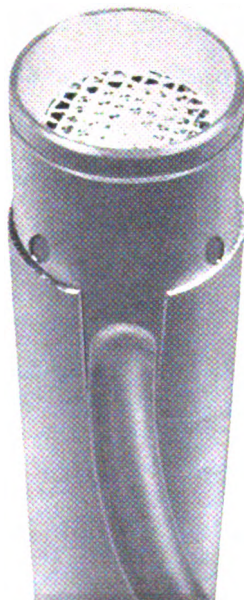
The Rails Company SWITCH HEATERS

Provide quick, sure heat to clear snow, ice or freezing rain from switches and other interlocking points.

Electric or gas operated (natural, propane or city).

Automatic or dispatcher control.

Easy to install — require minimum maintenance.



Best Combination for Automatic Heat Control

Rails Co. SWITCH HEATERS and SNOW DETECTOR

Rails Snow Detector starts heaters automatically when snow or freezing rain starts — turns heaters off when storm is over. Provide local or remote operation, or can be used to transmit signal to maintenance crews. Controls all types of heating equipment.

Write or call today for literature.



187 Maplewood Ave.,
Maplewood, N. J.
St. Louis, Missouri; Chicago, Illinois
In Canada: The Holden Co., Ltd.

NEWS BRIEFS

(Continued from page 37)

communications at Charlotte, N.C. In 1952, he was promoted to supervisor of communications. From 1955 to 1961 Mr. Hudson served as general supervisor communications at Charlotte. In 1962, he was appointed communications engineer at Washington, his most recent position.

● **SOUTHERN PACIFIC:** J. G. Zaiontz, Jr., has been appointed district communications supervisor at Lafayette, La., succeeding W. N. Olive, retired.

Supply Trade News

● **FARINON ELECTRIC:** Edward G. Hall, commercial sales manager, Lenkurt Electric Co., Inc., has joined Farinon in an executive capacity. James H. Eakin, area systems engineer, Motorola Communications & Electronics, Inc., Burlingame, Calif., and John P. Bartelme, EF&I engineer with Lenkurt, have joined Farinon as engineering consultants



James T. Hudson



Edward G. Hall



Herbert Rupp



James F. Somers

and project managers.

Mr. Hall began his communications career as a toll-plant engineer with the Wisconsin Telephone Co., in 1937. In 1943, he was appointed radio engineer for Wilcox Electric Co., and four years later was appointed transmission engineer with

Indiana Associated Telephone Co. In 1951, he joined Lenkurt as an engineering representative, and became sales manager and later commercial sales manager.

● **MICROFLECT CO., INC.:** Walter E. Hartley has been appointed advertising-marketing director with headquarters at Salem, Ore.

● **MOTOROLA, INC.:** Herbert Rupp has been appointed railroad account executive in eastern U.S. by Motorola Communications and Electronics, Inc. An electrical engineering graduate from Northwestern University, Mr. Rupp has been on the Motorola national office engineering staff since 1955.

● **OHIO BRASS CO.:** T. W. Passailaigue, district manager in Chicago, has retired. A native of Charleston, S.C., Mr. Passailaigue joined the Charleston Consolidated Railway and Lighting Co., in 1905. Four years later he joined Texas Co. In 1921, he became associated with Ohio Brass in the Chicago area, where he has been district manager since 1928.

● **WHITNEY BLAKE CO.:** James F. Somers has been appointed assistant sales manager. A graduate of Lafayette College, Mr. Somers had been district sales manager in New York State since 1958, with headquarters at Geneva, N.Y. He had had previous sales experience with General Electric and Kaiser Aluminum.

Obituary

● **WALTER J. LYONS,** retired communications engineer, Erie-Lackawanna, died November 22, 1964 in Cleveland, Ohio. Mr. Lyons, 65 years old, retired from E-L in February, 1964. He began his railroad career as a timekeeper on the Erie in 1915. From 1920 to 1940, he was a joint Western Union-Erie employee who served at various times as clerk, inspector and general foreman. In 1940, Mr. Lyons was appointed general foreman, communications, of the Erie. In January, 1956, he was promoted to communications engineer, the position he held at the time of his retirement last year.

Now Available

- Data Sheet Reprint: **Fundamentals of Electronics**
Information on vacuum tubes, semiconductors, tuned circuits, amplifiers, and oscillators. Price: \$1 per copy.
- Data Sheet Reprint: **Fundamentals of Electricity**
Electrical fundamentals plus information on batteries, rectifiers, motors and circuits. Price: \$1 per copy.
- Data Sheet Reprint: **Meters and Test Equipment**
Information on AC and DC meters; voltage, current, resistance and decibel measurements; and oscilloscopes. Price: 50¢ per copy.

Please send me ____ copy (ies) of **Fundamentals of Electronics** at \$1 ea.
 Please send me ____ copy (ies) of **Fundamentals of Electricity** at \$1 ea.
 Please send me ____ copy (ies) of **Meters and Test Equipment** at 50¢ ea.
 ____ Payment enclosed ____ Bill me.

NAME
 TITLE RAILROAD
 ADDRESS
 CITY ZIP # STATE

Mail coupon and order or payment to:
 Railway Signaling & Communications, 22 W. Madison St.,
 Chicago, Ill. 60602 Att: R. W. McKnight