CONSOLIDATED CODE

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ample: "Engine 547 back up 5 car lengths" rather than "Back up." In case of radio failure, or if radio contact is interrupted, movement must be stopped at once. Further movement must not be made until communication is made by words, or radio contact is restored.

412. Information that a train to be met or passed is in clear on siding must not be transmitted from head to rear end of train unless positive identification of the train to be met or passed has been made.

413. Train orders must not be transmitted by radio between head and rear end of train. **Note.**—Conversation between head and rear end of train relative to fulfillment of train orders in their possession is permitted.

414. Information must not be passed between head and rear end of train as to indication of train order signals. Employees on trains must not ask and employees at stations must not advise the indication of any train order signal or other fixed signal, nor the contents of any train orders affecting their train or any other train.

415. Except in emergency, or where specifically authorized, radio must not be used by the train dispatcher in the transmission of train orders. When so used, the rules covering train orders transmitted by telephone must be complied with.

416. Railroad radio must not be used for transmitting when located less than 250 ft from the scene of blasting operations, account of hazard of detonating dynamite charge where electric caps are used.

The train dispatcher will, upon advice from the foreman in charge, notify all trains operating in that territory the location of such blasting operations.

417. When using railroad radio there may be times when employees are not able to contact, or get response from another train or wayside station. If necessary to transmit important information, it should be transmitted regardless of whether or not an acknowledgment is received. When such information is transmitted, and no acknowledgment is received, necessary action must be taken based on the belief that the information was not received.

RAILWAY SIGNALING AND COMMUNICATIONS

News Briefs

TYPE OF SIGNAL PROTECTION	Jan. 1, 1959	Jan. 1, 1958
Block signal systems	107,693.6 Rd mi	109,894.8 Rd mi
	136,982.3 Tk mi	139,594.7 Tk mi
Train control, train stop and cab signals	14,198.1 Rd mi	14,227.9 Rd mi
	25,285.0 Tk mi	25,322.2 Rk mi
	9,344 Locos	9,770 Locos
Interlockings	4,160 Plants	4,184 Plants

CORRECTION: These are the right figures for total signaling installed in the U. S. (Feb. issue p. 48)

SIX AMERICAN RAILWAY signal department men are now in England assisting the British Railways with the final stages of the electrification program currently under way in London-Midland area. Faced with a shortage of trained signal designers to complete the electrification of this 200-mile territory of two and four-track systems, the British Railways appealed for assistance. A letter was circulated by the Association of American Railroads to chief operating officers throughout the country asking for volunteers. The following responded: **A. P. Boettcher** and **D. E. Cahill,** assistant engineers, signal department, New York Central, respectively from the Eastern and Western districts; **Bernard A. Andrews,** assistant signal inspector, and **Richard R. McGuire,** signal designer, Nickel Plate Road; **Harold H. Gudenrath,** inspector, signal, electrical and communications department, Reading; and **Raymond C. Bailey,** chief draftsman, signal department, Richmond, Fredericksburg & Potomac. The engineers will be based in England for a minimum of 18 months, with options for additional time, if needed.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS has scheduled for 1960 completion installation of automatic flashing light signals and short arm gates at eight grade crossings in St. Louis, Mo., at an estimated cost of $185,000. The work will be done by company forces.

ALTON & SOUTHERN will alter or relocate signaling and communications facilities and crossings, due to construc-

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NEWS BRIEFS

(*Continued from page 36*)

tion of highway overpasses at four locations near East St. Louis, Ill., at a cost of $81,840; also extend approach circuits and make other changes at A&S-Southern interlocking plant in East St. Louis, at a cost of $18,675. All work will be performed by company forces.

NEW YORK CITY TRANSIT AUTHORITY is conducting tests that are expected to make possible remote control operation of shuttle trains between Grand Central and Times Square stations. The tests, which are being conducted on a stretch of the BMT line in Brooklyn, use equipment developed by Union Switch & Signal, General Railway Signal, and Westinghouse Air Brake. If tests indicate that the project is feasible, the shuttle line may become a pilot project for the whole system.

CHICAGO TRANSIT AUTHORITY awarded a contract for $54,920 to Femco, Inc., of Irwin, Pa., for 70 transistorized, portable two-way train telephones for use on CTA's north-south elevated-subway route.

LONG ISLAND will install CTC between Hicksville, N. Y., and Smithtown, 22.5 miles, on its Port Jefferson branch. Cost will be approximately $500,000. The project is scheduled for completion next November. Control machine will be at Hicksville, where the branch joins the Long Island's mainline.

SANTA FE. The following signal projects, authorized in 1959 will carry over into this year:

Remote control of GI tower, Galesburg, Ill., from dispatcher's office at Shopton, Iowa.

Complete double-track traffic reversal, Medill, Mo., to WB Junction, Mo., controlled from Shopton, Iowa.

Remote control interlocking at Hardin, Henrietta, CA Junction and Sibley River Branch, Mo., from dispatcher's office at Shopton.

Lynn-Hebron, N. M., TCS (traffic control system) controlled from dispatcher's office at Las Vegas, N. M.

Remote control, Las Animas Jct., Colo., from dispatcher's office at Pueblo, Colo.

Double track traffic reversal signals on new line change Maine, Ariz., to Seligman, Ariz., controlled from dispatcher's office at Winslow, Ariz.

Complete TCS, Boron to Mojave, Calif., controlled from dispatcher's office at Fresno, Calif.

TCS Ricker (Brownwood) to Belt Jct., Texas, controlled from dispatcher's office at Ft. Worth.

This year's signal program includes:

Install dragging equipment detectors at Curtis and Gerlach, Okla.

Install hot box detectors near Ft. Sumner, N. M.

TCS, Lubbock, Texas, to Texico, N. M.

Convert ac signaling between Isleta N. M.; Belen, N. M.; and Gallup, N. M. to battery standby.

Rearrange yard at East Dallas.

TCS, Ft. Worth to Belt Jct., Texas controlled from Ft. Worth.

Microwave installations were completed in 1959 between Los Angeles and San Bernardino, Calif., and between Bakersfield and Barstow, Calif. Installation between Winslow and Seligman Ariz., authorized in 1959, will be completed this year.

Microwave installations authorized this year include: San Bernardino-Barstow Calif.; Barstow, Calif.-Seligman, Ariz and Amarillo, Texas-Topeka, Kan.

NEW YORK CENTRAL patrolmen now have lightweight two-way radios for instant communications between themselves and this road's headquarters in New York City. The police protect NYC property in New Jersey, Westchester county, N. Y., and New York City.

While checking a car seal, the sergeant receives a radio call hearing it over the disc loudspeaker by his left ear. Should he desire to call headquarters or one of the NYC police cruiser cars, he presses a button on the microphone (on his right lapel) and talks. Total weight of the radio transmitter and receiver units on his belt are about 4 lb. The transmitter antenna (unit at a patrolman's right) is pulled up to give greater range of broadcasting. The system operates on 161.220 mc.

RAILWAY EDUCATIONAL BUREAU, a 45-year-old organization engaged in apprenticeship training programs for railroads, has been acquired by Simmons-Boardman Publishing Corporation, publishers of Railway Signaling and Communications. **B. Charles Walters,** supervisor of apprentice training of the Rock Island, has been appointed director of the Bureau. Courses presently offered by the Bureau cover all phases of the locomotive and car department, the signaling

(*Continued on page*

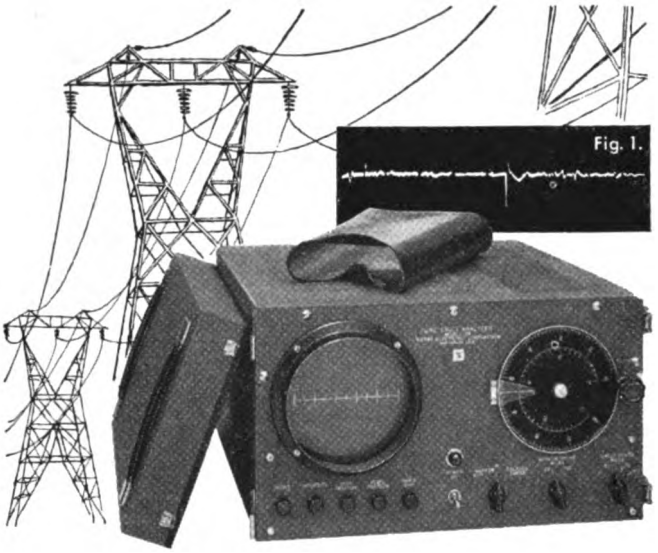


Figure 1. Display of 60 Kv line grounded at 27 miles.

Locate circuit faults exactly ...½ to 200 miles distant

Communication and power lines

Use on any open wire line

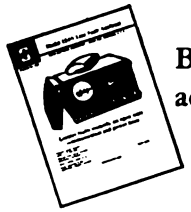
Direct reading, simple to use

Use at carrier terminal, powerhouse, sub-station

Shorts, grounds or opens up to 200 miles away can be located within a few yards with the improved Sierra 124A Line Fault Analyzer. The instrument, operating on radar principles, sends a high amplitude pulse along the line under test. Discontinuities, even capacitors and transformer banks, appear clearly; a complete picture of the line and its condition appears on the radar-type "A" scope.

Two Pulse Widths

To insure maximum readability, two pulses — a 1 microsecond, 1,000 volt pulse or an 8 microsecond, 500 volt pulse —are provided. Other features include a sweep delay, movable distance step, sweep repetition rate of 60 cps and a high intensity flat faced cathode ray tube. Provision is made for camera attachment to the scope face.



Bulletin gives details, actual utility operating experiences

Data subject to change without notice.

Sierra Electronic Corporation

A Division of Philco Corporation

4695T Bohannon Drive • DAvenport 6-2060

Menlo Park, California, U.S.A.

Sales representatives in Major Cities

Canada: Atlas Instrument Corp., Ltd., Toronto, Montreal, Vancouver, Winnipeg

Export: Frazar & Hansen, Ltd., San Francisco, New York, Los Angeles

NEWS BRIEFS

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department and supervisory training Courses covering other departments of the railroads are planned.

BALTIMORE & OHIO and NEW YORK CENTRAL have received ICC approval to replace a mechanical interlocking with an automatic interlocking at Chrisman, Ill.

INDIANA HARBOR BELT has ordered Motorola two-way radio for installation on 40 diesel engines. The units are the new transistorized equipment operating directly off the 64-volt diesel engine battery.

NEW YORK CENTRAL has applied to the ICC for approval to install a traffic control system between Berea, Ohio, and Toledo, 94 miles. Present sections of four and three tracks will be reduced to traffic controlled sections of two and three tracks. The application also requests permission to rearrange existing automatic block signal and automatic train stop systems between these points, as well as modifications to four interlockings and discontinuance of six interlockings.

CENTRAL OF GEORGIA has received ICC approval to install CTC on single track between Trammells, Ala., and Sterrett, 30 miles, with 10 control locations to be controlled from Sylacauga (near Trammells), in lieu of existing automatic block signaling. The road will not be required to electrically lock five hand-operated main track switches to be installed in this territory, because trains will not be permitted to clear the main track when using the switches at these five locations.

KANSAS CITY SOUTHERN, at a cost of $1,500,000 will install centralized traffic control between Heavener, Okla. and Siloam Springs, Ark., 109 miles.

DELAWARE & HUDSON will install CTC on 27 miles of mainline between Wilkes-Barre and South Scranton, Pa. and between Scranton and Carbondale Pa. The installation is expected to cost $635,000. With the completion of this project and the $1,463,000 CTC between Afton and Schenectady, N. Y. (RS&C Jan. 1960, p. 42), the D&H will have 310 road-miles or 66 per cent of its mainline equipped with centralized traffic control.

LOUISVILLE & NASHVILLE plans to improve its DeCoursey yard at Cincinnati, according to a recent statement by President William H. Kendall. "We will largely retain present facilities, which include retarder operation for northward

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traffic; but we will add retarders for southbound traffic, a southbound classification yard, and expanded receiving and departing trackage," said Mr. Kendall.

CANADIAN NATIONAL TELEGRAPHS has installed equipment to condition air by means of a refrigeration process for the supply of dry air to communications cables that are maintained under constant pressure. This first installation of supplying cooled air to communications cables is at Moncton, N. B. Other installations are planned for Halifax, New Glasgow, Campbellton and Newfoundland, as well as other locations in Ontario and Quebec.

GREAT NORTHERN has applied to ICC for permission to install a traffic control system on single track mainline between Bainville and Dodson, Mont., approximately 200 miles. Sixteen controlled locations will be controlled from a CTC machine at Havre, Mont. The new CTC will be in lieu of existing automatic block signaling.

LONG ISLAND will install flashing-light signals and automatic gates at seven highway-railroad grade crossings at a cost of $237,000. The new protection equipment will replace watchmen now on duty at the crossings.

PENNSYLVANIA has received ICC approval to install traffic control on single track between Davis and Lebanon, Ind., 25 miles. The new CTC will be in lieu of existing manual block signaling.

NORFOLK & WESTERN has received ICC approval to install a traffic control system on single track between Burkeville and Abilene, Va., 21 miles. The control machine will be located at Crew, Va.

CITY OF NEWARK, N. J., has installed radar at a grade crossing protection project where the Pennsylvania and Lehigh Valley cross each other and two busy intersecting streets. Timed and radar controlled traffic signals have replaced gates on industrial tracks. Trains have to stop at the red traffic signal, and a trainman pushes a button. If the radar unit indicates no vehicular traffic, the train gets a green signal immediately, otherwise a maximum wait of 60 seconds may be required as the timer cycles. After the train has cleared the crossing, a trainman must again push a button to allow the signals to go back into their regular rotation for street traffic. The system also provides interlocking protection between

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the two railroads. There are no track circuits or other railroad circuits included in the new installation.

Trade Publications

EDUCATIONAL PUBLICATIONS: Recently released Rider books include: How to Use Meters, No. 144; Magnetic and Electrical Fundamentals (Franklinian Approach), No. 200-8; Advanced Magnetism and Electromagnetism, No. 166-26; and Principles of Frequency Modulation, No. 223. All of these books make extensive use of illustrations and would be suitable for use in training courses. Also released: Encyclopedia on Cathode Ray Oscilloscopes and Their Uses, a huge 3-in. thick, 8½ by 11-in., 7-lb compendium on the circuits, operation, and use of oscilloscopes. Chapters on testing and measuring pulses, phase, frequency, transmission, alignment of AM, FM and TV receivers, and others, are included. **John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y.**

ELECTRONIC CATALOG—Radio Shack 1960 Guide to Electronic Buying is now available, free of charge, to industrial buyers and engineers who mail requests on their company letterheads. Over 40,000 items are listed in the 312-page issue devoted to industrial electronic parts and equipment. The 8½ by 11-in. page permits easier reading of detailed, or tabular information. Innovations include technical articles, engineering specifications, electronic symbols, schematic diagrams and useful formulas. **Radio Shack, Inc., Dept. RSC, 223 Harvard St., Brookline, Mass.**

"STANDBY ELECTRIC PLANTS and Controls—A Guide to their Selection and Installation" is an 8-page, 8½-in. by 11-in. folder outlining the steps to be considered in the selection of an emergency generating plant. The folder lists items to evaluate to meet requirements, for example: manual, automatic or instantaneous starting, type of fuel, air or water cooling, special heaters, radio shielding, plant exercisers and instrument panels. A brief description of the Instapac Inverter Power Unit (RS&C, May 1959, p. 57) and transfer controls is included. Ask for "Sweet's File Folder, 32C/ON." **D. W. Onan & Sons Inc., Dept. RSC, 2515 University Ave., S.E., Minneapolis 14, Minn.**

UNION DEVELOPMENTS: UD 288, Model 32 Electro-Pneumatic Car Retarder; UD 289, Phase Selective A-C Coded Track Circuit (see RS&C, Sept. 1959, p 28); UD 290, The 528 Code Control System; UD 291; Buffer Spring Head Rod; UD 292, Style FR Hi-Shunt Track Circuit (see RS&C, Sept. 1959, p 30); and UD 295, DA-10 Direct Acting Switch Machine have just been released. **Union Switch & Signal, Division of WAB Co., Dept. RSC, Swissvale, Pa.**

Railroad Personnel

CANADIAN NATIONAL—**Samuel A. M. Moores,** assistant plant supervisor, communications department, at St. John's, Nfld., appointed plant supervisor there.

ILLINOIS CENTRAL—**E. T. Anderson,** field signal engineer, has retired. **A. C. Lehrman,** signal inspector and **J. T. Lindsey,** chief draftsman at Chicago, have been promoted to field signal engineers. **W. G. Turner,** assistant engineer at Memphis, Tenn., also promoted to field signal engineer and succeeded by **J. L. McNabb. W. E. Bromley** promoted to chief draftsman and **L. K. Atwood** to assistant chief draftsman at Chicago.

JERSEY CENTRAL LINES. **G. H. Zimmerman,** telegraph and telephone supervisor, retired March 1.

LONG ISLAND—**Claud W. Hammond** appointed inspector of signals and electric traction, headquarters Jamaica, N. Y.

NEW YORK CENTRAL—**Robert C. Karvwatt,** director of communications, has assumed the responsibilities of the general superintendent of communications in addition to his regular duties. The post of general superintendent was previously filled by **John L. Niesse,** recently retired. Mr. Karvatt, who is 40, has been employed by the Central since January 1959. Before joining the railroad he was associated with RCA International and the E. C. Page Co., consulting engineers. A native New Yorker, he received

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NEWS BRIEFS

(*Continued from page 44*)

a B.S. degree in electrical engineering from George Washington University in 1949.

O. H. Steffens, assistant signal supervisor at Cleveland, appointed assistant field signal engineer in charge of installation of CTC system between Berea and Vickers (Toledo) Ohio, with headquarters at Toledo.

NORFOLK & WESTERN—**Wythe D. Felty,** inspector signals and communications, has retired. **John C. Williams,** formerly supervisor telegraph and signals of the Virginian, is now supervisor of communications of the N&W.

PENNSYLVANIA—**C. V. Rogers** appointed assistant supervisor, communications and signals, at Indianapolis, Ind.

SOUTHERN. **Robert H. Allen,** assistant signal and electrical supervisor at Greensboro, N. C., appointed signal and electrical supervisor at Charlotte, N. C. **Charles R. Dawkins** has succeeded Mr. Allen at Greensboro. **William O. Junker,** signal and electrical supervisor at Spartanburg, S. C., has retired.

SOUTHERN PACIFIC—**Royal M Scott,** assistant superintendent of com munications, has been appointed superin tendent of communications, Pacific Lines at San Francisco, to replace **A. E. De Mattei,** promoted to superintendent o communications—system (RS&C, Feb 1960, p. 42).

A. E. DeMattei

R. M. Scott

Mr. DeMattei was born in San Fran cisco, August 7, 1895. He entered the em ploy of the SP in 1909 as a messenger in the stores department. He held variou clerical positions in the stores and operat ing departments until 1917, when he was transferred to the communications de partment. In 1935 Mr. DeMattei was pro moted to assistant to the superintendent communications, in 1943 to assistant su perintendent of communications, and in 1950 he became superintendent of com munications of the Pacific Lines.

Mr. Scott was born in Tucson, Ariz., in 1927, and started with the SP as a groundman in 1944. After serving with the U. S. Army Signal Corps from 1945 to 1948 he returned to his former position with the SP, subsequently being promoted to lineman, cable splicer, equipment in staller, and assistant district comunica tions supervisor. In 1954 he was appointed district communications supervisor at Sac ramento, Calif., and in 1957 assistant su perintendent of communications at San Francisco.

GREAT NORTHERN. **L. H. McFadden,** superintendent of communications at St. Paul, Minn., retired November 1959. **John J. Maloney,** formerly superintendent of communications at Spokane, Wash., is now superintendent of communications, system, at St. Paul.

Mr. McFadden began with the GN as a messenger in Minot, N. D. in 1907. He was later telegraph operator, wire chief and manager of the telegraph relay offices in Minot and St. Paul. In 1955 he was appointed assistant superintendent communications at St. Paul and in 1957 superintendent communications there.

Mr. Maloney was born May 3, 1902, at Ennismore, Ont. He entered railroad service in 1919 on the Canadian Pacific. In 1920 he went with the GN telegraph department as construction crew lineman, advancing through the positions of dis-

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NEWS BRIEFS

(*Continued from page 46*)

trict lineman, telephone inspector and district foreman at St. Paul. In 1956 he was appointed assistant superintendent communications at Spokane, Wash., and in 1957 superintendent communications there.

Obituary

G. H. NEELEY, supervisor telephones and signals of the Seaboard Air Line at Tampa, Fla., died February 11.

Supply Trade News

RAILROAD ACCESSORIES CORP.—**Edward M. Deems** has been appointed manager of sales. He has been associated with Raco in the capacity of sales engineer for several years.

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.—**Marvin Gunter** appointed district manager of microwave and industrial product sales in the southern and southwestern states with headquarters at Dallas, Texas.

LENKURT ELECTRIC CO.—**Alan F. Culbertson** appointed director of engineering with responsibility for development of telecommunications and allied systems for commercial and government use. Mr. Culbertson has been with Lenkurt since 1952 and previously headed the mobile telephone group.

Alan F. Culbertson

Harry W. Colcombe

UNION SWITCH & SIGNAL, Division of Westinghouse Air Brake Co.—**Harry W. Colcombe,** application engineer, appointed sales engineer, with headquarters in Pittsburgh, Pa. Mr. Colcombe was born in Pittsburgh September 8, 1927. After graduating from high school in 1945, he served in the U. S. Army Air Force until 1947. In September of that year he was employed by US&S as a wiring designer, a position he held until April 1951. He then spent one year as an electrical engineer with the Koppers Construction Co. In March 1952 he returned to Union Switch & Signal as a wiring designer, and

(*Continued on page 50*)

NEWS BRIEFS

(*Continued from page 48*)

in November 1954 was assigned as an application engineer. Mr. Colcombe attended evening classes at the University of Pittsburgh, where he majored in electrical engineering.

CURRENT CONTROLS CORP.—**David M. Key, Jr.,** appointed eastern district manager with headquarters in New York. He was formerly with the Railroad Products Division of Servo Corp. of America.

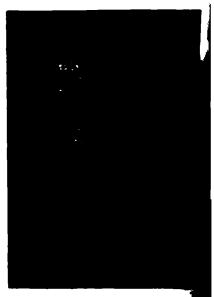
FANSTEEL METALLURGICAL CORP.—**J. V. DiMasi** appointed advertising manager.

STROMBERG-CARLSON—**Frank A. Morris,** director of telecommunications research, appointed acting director of engineering of the S-C special products division.

Carl A. Reeb

Marshall C. Blevins

D. E. Skyllingstad



Thomas H. Kearton

KERITE COMPANY—**Carl A. Reeb,** western manager at Chicago, appointed assistant to the president. He has been succeeded by **Marshall C. Blevins,** heretofore assistant western manager; **Dale E. Skyllingstad** has been appointed to succeed Mr. Blevins.

Mr. Reeb joined Kerite in 1912, after attending Chicago Business College and Lewis Institute (now Illinois Institute of Technology). He served as a first lieutenant with the 331st Machine Gun Battalion in France during World War I. He was made a sales representative for the Chicago office on rejoining Kerite after the war and became western manager in 1942.

Mr. Blevins worked out of the New York office for a short time after joining Kerite in 1940 and was later transferred to Chicago. He became assistant western manager in 1951. Earlier, he was associated with Lever Bros., the New York Central, and the mechanical department of the Boston & Maine.

Mr. Skyllingstad joined Kerite in 1946 as district engineer at Chicago. A native of Milford, Iowa, he received a BS degree in electrical engineering from Iowa State College in 1935. He was afterwards employed in the public utility and industrial fields. He served in North Africa and Italy in World War II, attaining the rank of major and serving as assistant G-3 with the 1st Armored Division.

KLEINSCHMIDT DIVISION, Smith-Corona Marchant Inc.—**John H. Adams** appointed sales manager of communications systems for the data processing division, at Deerfield, Ill. He will be responsible for commercial sales of printed communications and data transmission systems produced by the Kleinschmidt Division of SCM.

KOPP GLASS, INC.—**Dr. C. E. Leberknight** elected vice-president in charge of research and engineering.

ANACONDA WIRE & CABLE CO.—**E. J. I. Davies** named manager—railroad sales, at Chicago.

Obituary

J. I. GRAMMER, formerly sales engineer in Chicago and New York district offices of Union Switch & Signal—Division of Westinghouse Air Brake Co., died February 17.

THOMAS H. KEARTON, 66, retired signal engineer of Western Railroad Supply Co., died February 9. Mr. Kearton was for many years with the Chicago Great Western, resigning as signal engineer in 1952 to become signal engineer of Western Railroad Supply Co. He retired in November 1958.

SIGNALING AND COMMUNICATIONS

Editor's Corner

This month's lead-off feature might be described as the second section in a two-part series on automation in signaling—specifically CTC. Last month we published a feature article on how the Norfolk & Western provided automatic clearing of CTC controlled signals. This month's article tells how a computer is used to simulate train operation in CTC territory.

The N&W achievement is significant in at least two respects: (1) It eliminates much of the repetitive duties of the dispatcher, giving him more time for better handling of meets and passes, and other duties; (2) it is the first major step toward automatic CTC control.

As to the first part, the new pushbutton CTC machines are extending dispatcher's control ever further. But can one dispatcher handle 500-mile territories? One railroad has two dispatchers on duty, 8 a.m. to 4 p.m.—one to handle telephone work and the other to operate the control machine. Automatic CTC signal clearing would reduce the work load so that one man could do the job.

The N&W went further and designed circuits to operate switches and clear signals for making meets (RS&C, Feb. 1960, p. 18). These controls are **not** in service. Their installation was not economically justified because the dispatcher could not be eliminated.

The N&W signal department has shown the way toward automated CTC. Certainly there are other CTC territories where automatic clearing of CTC signals is feasible and economical. The N&W automatic switch and signal control for meets might also be applied in these territories.

Now that the first step has been taken, it seems logical that others will do likewise—or devise their own circuits and engineering toward accomplishing the goal of automated CTC.

I do not foresee the elimination of the dispatcher, but I do see his repetitive duties reduced to a minimum. Thus with automated CTC, the dispatcher will have more time to devote to the unusual operations and emergencies—as well as better planning to expedite train movements.

This month's article concerns cooperation between the General Railway Signal Co. and the Canadian Pacific Railway in simulating train operation in CTC territory. Here again, other railroads with digital computers can work out similar programs for analyzing CTC operations. This would help signal engineers in planning future CTC projects, as well as modernizing older existing installations.

Computer programming for CTC is another step forward for railway signaling. But this step and that of automatic clearing **should** be continued and advanced by others. Here is another opportunity for the signal engineer to take the initiative in providing modern, economic signal systems for his railroad. He should not wait for his management to ask for progress in signaling.

Bob McKnight