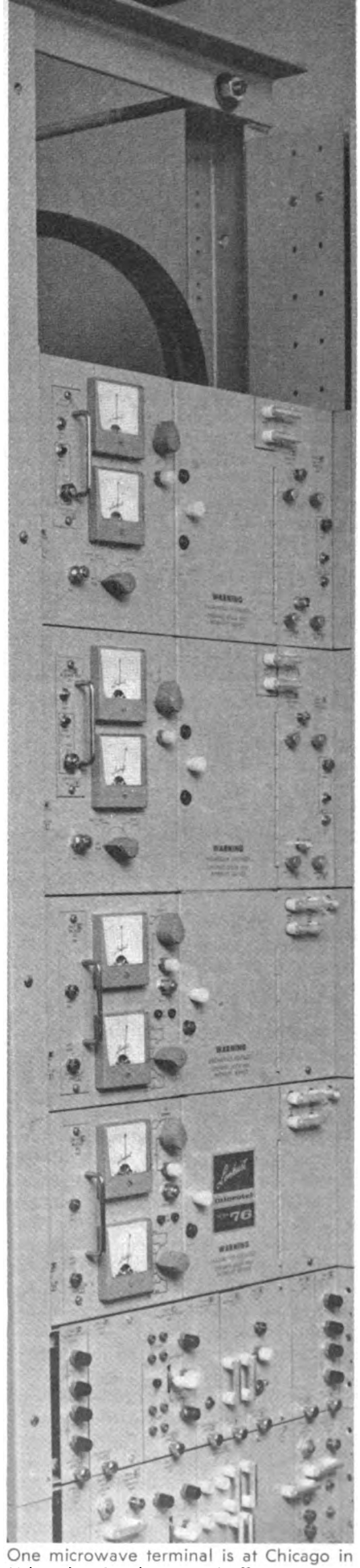
Milwaukee installs its first microwave

The Milwaukee Road has recently placed two communications projects in service. First, the road has completed hotbox detector installations on its Chicago-Council Bluffs mainline. The latest installation consists of five sets of detectors strategically located in Iowa. Findings of the detectors are immediately transmitted to central locations where trained personnel read the recording tapes. If evidence of an overheated journal is observed, the train crew is promptly notified via two-way radio. Second, the road's first microwave system has gone into service between its Chicago headquarters and the Bensenville, Ill., automatic classification yard, 17 miles west.

"The first step in the expansion of a modern electronic communications network," is how Walter E. Fuhr, assistant chief engineer signals and communications, characterizes the new microwave system. It is designed to carry the railroad's dial telephone, teletypewriter and high-speed data transmission circuits. Thus car and train movement data, payroll, messages and telephone conversations will be sent from the Chicago general office via microwave to Bensenville yard, from which point they will travel via existing circuits on open wire lines to Kansas City, Mo., Omaha, Neb., Sioux City, Ia., Sioux Falls and Mitchell, S.D., and intermediate points.

Mr. Fuhr anticipates that microwave will be expanded to other locations on the Milwaukee Road. Field studies have been completed for extending this present microwave system west from Bensenville to Savanna, Ill., 121 miles. Other proposed microwave links would connect Chicago with Milwaukee and Minneapolis-St. Paul.

The Chicago-Bensenville microwave system . . . "is a kind of three-cushion billiard shot . . ." says Mr. Fuhr. At Chicago, the microwave signal is beamed from an 8-ft dish antenna atop Union Station toward a stainless steel reflector on the nearby Riverside Plaza building. Here the signal bounces westerly to another reflector, this one on top of a 150-ft tower at Bensenville yard, 17 miles distant. From this reflector, the microwave signal is beamed down to the receiving dish antenna.



One microwave terminal is at Chicago in Milwaukee Road's general office.

Hotbox detector recorders are in the Perry, Iowa dispatcher's office.

Although the system has a capacity for 600 voice channels, it is not being used to that capacity at the present time. For each voice channel, up to 18 telegraph channels can be handled. This new microwave system, using Lenkurt Electric Co. equipment, replaces a cable system that was limited to 76 channels.

Important reasons for installing this initial microwave link include: (1) impervious to the weather; (2) high reliability; (3) large channel capacity; (4) capability to handle high-speed data transmission; and (5) vital link for an expanded microwave network because this first system connects to the road's general office.

Five sets of hotbox detectors have been placed in operation on the Milwaukee mainline in Iowa. Four of the detectors are located at Keystone, Maxwell, Coon Rapids and Persia. Information from the detectors is sent via wire line carrier equipment into the dispatcher's office at Perry, where a continuous graph-like record is made on paper tape by each detector. The fifth hotbox detector, located at Elwood, Ia., reports to a graphic recorder at Green Island, Ia.

The Perry dispatcher, upon seeing a higher-than-normal pip on the detector recorder tape, promptly alerts the train crew via two-way radio. So that he may talk via a wayside radio station within range of the train, he looks at his centralized traffic control panel to locate the train. Fast action of this kind, reports Donald L. Wylie, communications engineer, has been possible through the installation of radio equipment on locomotives and cabooses of all trains operating on this Iowa mainline. In addition, 11 wayside stations have been radio equipped. Mr. Wylie added: "The Milwaukee is the first Chicago-based railroad to extend this type of train protection [hotbox detectors] all the way from Chicago to the Missouri River [485 miles]." RS&C