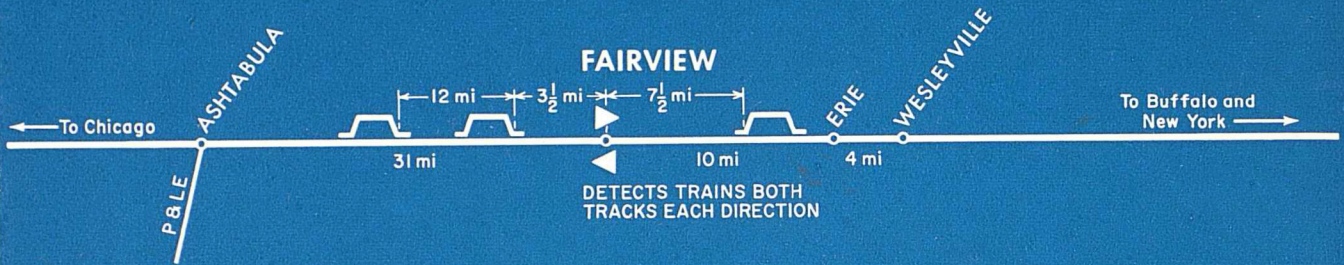


## HOT BOX DETECTORS : NOW



# Carrier Sends Hot Box Indications ... to Dispatchers' Office

**New York Central installed hot box detectors in CTC territory to inspect journals on freight trains running in either direction on each of two main tracks. Detectors are at Fairview, Pa., 10 miles west of Erie, where the graphic recorders are located in the dispatchers' office in the passenger station**

DURING A THREE WEEK PERIOD, the hot box detectors inspected 541 freight trains on which 70 journals were recorded as being abnormally hot. Disposition of the 70 cars was as follows: 21 cars were set out, the journals allowed to cool, and after inspection and repair as required, the cars were forwarded. On 30 cars the indicated journals were rebrassed and the cars forwarded. Of 12 hot journals, the cars were not set out. The journals were lubricated while the trains were in yards or on sidings, after which

they continued on their way. Similar action was taken regarding five cars on which the journals were re-packed. Brakes were found sticking on two cars. This was remedied after the train was stopped to check after the hot journal report. These cars were not set out.

### In Heavy Traffic Territory

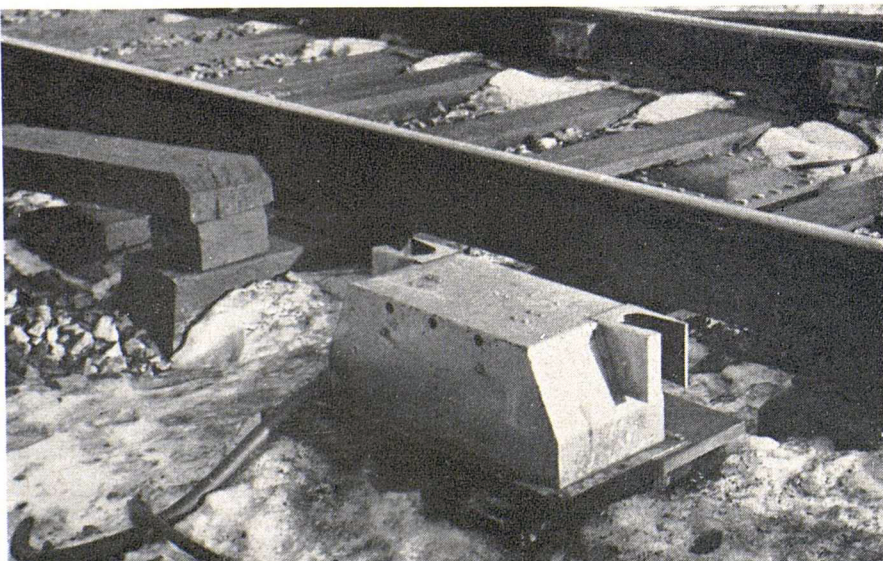
To be most effective, the Central reasoned, the detectors should be located on a heavy freight traffic line and where the train or cars can

be sidetracked if a box is hot. Therefore, the detectors should be about 30 to 40 miles from a yard where the journals were last checked and inspected. Experience on other roads is that it takes about 30 miles of running for a journal to heat up, if it is going to heat at all.

With these factors in mind, Fairview, Pa., was decided as the location most applicable. First, it is on the heavy traffic New York-Chicago mainline, 10 miles west of Erie, Pa. Daily traffic consists of 23 eastbound freight trains and 22 westbound, with 12 local freights each way. Three to four more freight trains are run during peak traffic periods. Second, controlled sidings into which trains can be directed are located 7.5 miles east, 3.5 or 15.5 miles west of Fairview. Westbound trains are checked by their crews, eastbound trains are checked in Wesleyville yard, Erie. Third, the detectors here are 31 miles east of Ashtabula, Ohio, a point where freight trains from Youngstown and Pittsburgh come onto the mainline.

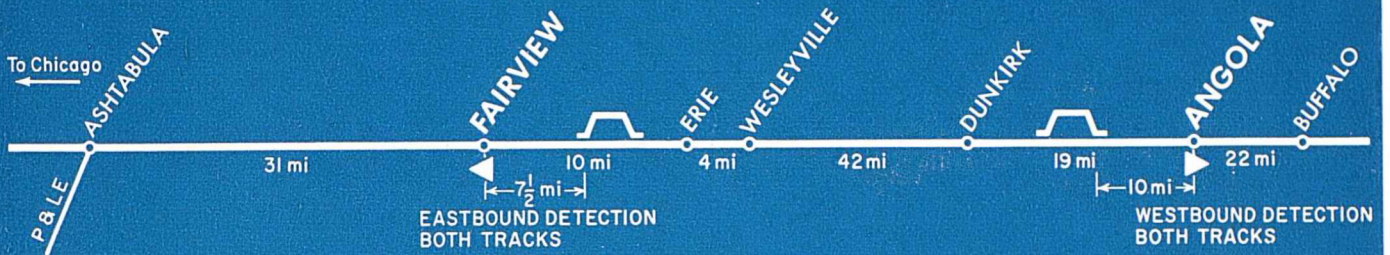
### Carrier Transmits Indications

When the detectors were first installed in September 1957, the graphic recorders were installed in a wayside housing with the amplifying equipment. Employees on duty 24 hours, observed the recorders and telephoned "hot journal" information to the dispatchers at Erie. Although this arrangement operated satisfactorily, the advantages of having the graphic recorders in the dispatchers' office was that the dispatcher acts upon the "hot journal" information by putting a controlled signal to stop.



Hot box detectors now in service view journals going in either direction

## HOT BOX DETECTORS : FUTURE



When the train crew calls in, he tells them the location of the hot box journal.

Thus the problem was simply one of being able to take the output of the hot box amplifiers and sending it over existing line wires to the office at Erie and feeding it into the graphic recorders. General Railway Signal Company came up with the solution, a 20-kc carrier operating on the CTC code line, with four FM tones for the detector outputs (one for a detector on each of the four rails).

### "Central" Practice for Hot Box Detection

The graphic recorders and the carrier receiver are in the chief dispatcher's office at Erie. When a train is passing Fairview, an assigned employee reads the tape, knowing that the deflection of the stylus is proportional to the heat radiated from the journal box. To

read the tape, the man counts the deflection of the stylus in millimeters and subtracts the deflection of the journal on the other end of the same axle. If this difference is 9 mm or more on an eastbound train or 10 mm or more on a westbound train, it is a reportable indication. Roller bearing cars give indications comparable to hot boxes and are readily identified by high readings on all journals of the car.

When indications are reported, the location of the car in the train, the side of the train that the indication is on and the location of the journal on the car, are given. For example: 31 head car, No. 3 journal, south side. Journals are counted from the head end. Cars are given from the nearest end of the train, except that whenever feasible, the cars are given from the head end. For each train recorded, the tape is marked with the train, engine number, track, direction and time, as well as north or south rail. A

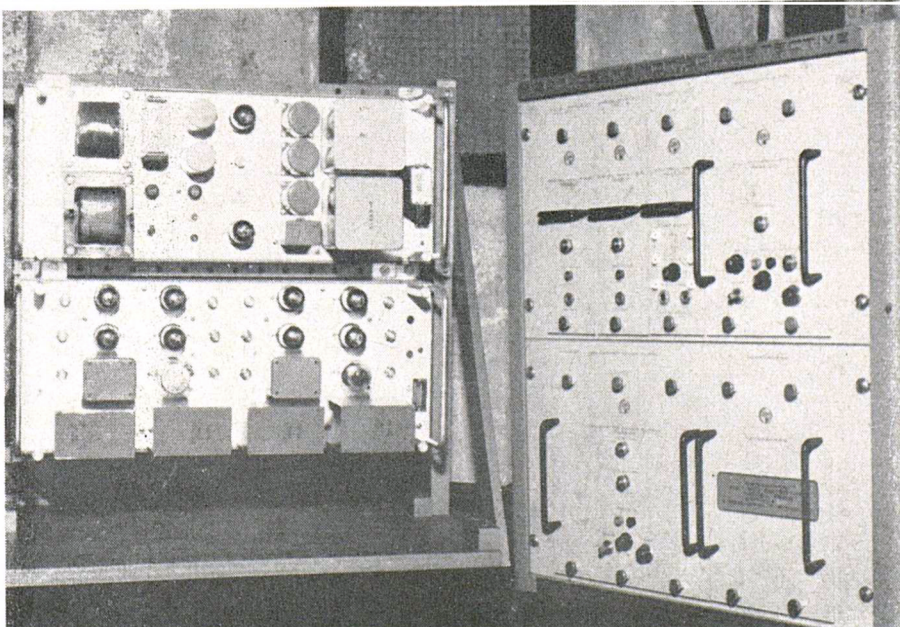
separate hot box record is also kept which includes this information as well as the initial and number of the car, its type and what was done with the car.

### Detectors to Be Moved

The double-direction detectors at Fairview have been more or less temporary, in the form of an experiment to determine their usefulness. The Central plans to install single-direction detectors at Fairview to inspect eastbound trains. Any of these trains showing hot journals will be yarded at Wesleyville, where they will be checked by car inspectors, as at present. Detectors for checking westbound trains are to be installed at Angola, 22 miles west of Buffalo. Trains indicating "hot journals" will proceed to Dunkirk yard, where they will be checked by car inspectors. The graphic recorders will remain at Erie, and the indications from the Angola detectors will be sent via the carrier over the code line.

As this is in CTC territory, the dispatcher will be able to direct trains into sidings if the need arises, before the train reaches either Wesleyville or Dunkirk. Westbound trains inspected at Angola can be directed into a siding 10 miles west of the detectors. Angola was selected for westbound train hot box detection, because it is about 30 miles out of Buffalo yard, as well as being east of Dunkirk where car inspectors are located.

The hot box detectors and amplifying equipment were furnished by Servo Corporation of America, and the carrier equipment by General Railway Signal Co. Installation was by signal department men directed by Joseph V. Hancock, Signal Supervisor, under the jurisdiction of John H. Sawyer, Western District Signal Engineer.



Carrier transmitter (at left) and hot box amplifier equipment (at right)