What's the Answer?

Can You Answer These Questions?

- How often do you check or change out tubes used in amplifiers in service 24 hours a day (such as used on dispatcher's and monitor's postions)?

- On duplex circuits, who does the balancing—operator, wire chief or maintainer? Why?

- How is the maintenance of hot box detectors and associated equipment handled on your railroad?

- Have you had any experience with an electric switch machine creeping away from its full throw position? In the event that an electric switch machine should creep **after** a signal over it had been cleared, what provision is made for restoring it to the full throw position?

Please send us your answers to these questions. We pay for all answers when they are published. Answers will be published anonymously if requested. Write Editor, Railway Signaling and Communications, 30 Church St., New York 7, N. Y. Also please send us questions for this department.

Warning Devices

Do you use any type of supplemental warning device, visible or audible, in the approach to movable bridges? What is your philosophy concerning the use of such a device?

Crew Might Depend on Device

H. W. DUNN, Signal and Electrical Engineer, Chicago & Western Indiana, Chicago, Ill.

We do not use any supplemental warning devices in conjunction with our signal system for movable bridges or other extra hazardous locations. Of course, I might ask what is meant by "extra hazardous" locations. To me, one interlocking plant is either as hazardous or safe as another, and a movable bridge is not any more hazardous than an interlocking.

If a train crew chooses to ignore and run by a home signal in an interlocking plant, just as many lives could be lost and just as much damage could be done, if not more, than if they run by a signal into an open bridge.

In my opinion, a supplemental warning device would only tend to make the crew more dependent on the supplemental device and less attention would be given the primary governing device, the signal.

Editor's Note: *The phrase "extra-hazardous" was perhaps not the best term, but it was meant to denote locations where sections of track were physically removed. The thought is that running past a stop signal MAY not cause an accident, but if a section of track is removed, a derailment is guaranteed. Similarly, many roads have removed derails at interlockings for the reason that they caused more derailments than they prevented accidents.*

No Need For Supplements

E. B. WALKUP, Signal Engineer, New York, New Haven & Hartford, New Haven, Conn.

There are no supplemental warning devices, visible or audible, in the approach to movable bridges on the New Haven, except in the state of Massachusetts, where we have mechanical gates that must be lowered before bridges can be opened.

As to my opinion concerning such devices: I am not in favor of adding supplemental devices. I think the standard signal systems, derails, and locking devices provided for bridges are sufficient for maximum safety. If rules and regulations are adhered to by train crews and operators controlling the signals and bridges, no difficulty would be encountered.

Snow Shields

Is snow adherence to signal roundels a problem on your railroad? If so, how do you overcome it? If you use snow shields, do you leave them on the year around?

Use Heated Lens

E. A. THOMPSON, Assistant to Signal Engineer, Western Pacific, San Francisco, Calif.

Generally each winter we experience some difficulty with snow adhering to signal roundels which on occasion obscures the view of the signals to such an extent as to delay trains. A few years back we installed special heated lenses at three test points in extremely heavy snow territory. The lenses have proved satisfactory, but due to the number of signals involved and the limited amount of power available through the remote desert areas of northern Nevada and Utah, we have not considered it feasible to install the heated lenses out of face.

We have not attempted to use snow shields since in most cases the prevailing winds drift the snow in such a manner that the shield would be ineffective.

Island Track Circuit

What has been, or can be done to overcome the problem of failures of a center-track ("island") circuit subject to salt and similar crossing ballast conditions at an automatic highway crossing protection installation?

Repeated Checking

A. L. ESSMAN, Chief Signal Engineer, Burlington Lines, Chicago, Ill.

Simply stated, the answer to the problem would be to determine the minimum ballast resistance during the worst condition and adjust the track circuit accordingly.

The ballast resistance of a track circuit is constantly changing and it must be understood that after repeated salting of the island section year after year, that the track section is liable to get worse, especially if more salt is applied during one season than another. This necessitates watching to determine that proper adjustments are maintained. This, however, is no different from other track circuits in which there are some construction projects involving grading wherein the ballast will become dirty. It is a problem of repeated checking so as to know that the resistance applied to the circuit will permit a current flow sufficient to operate the relay over and above that which is lost through ballast leakage.

Automatic OS

Do you have any type of automatic OS device in use in non-CTC territory? What is it, how does it work?

Have Three Types

R. M. LAURENSON, Superintendent Communications, St. Louis-San Francisco, Springfield, Mo.

The Frisco has installed OS devices at a number of places, all of which have been put together by our own forces and are relatively simple.

One type is used in connection with a dispatcher's telephone line, and installed at highway crossing locations. A small buzzer is connected in series with one winding of a No. 29 induction coil, and in series with a contact on the track relay, and on the flasher relay. The secondary of the No. 29 coil bridges across the tele-

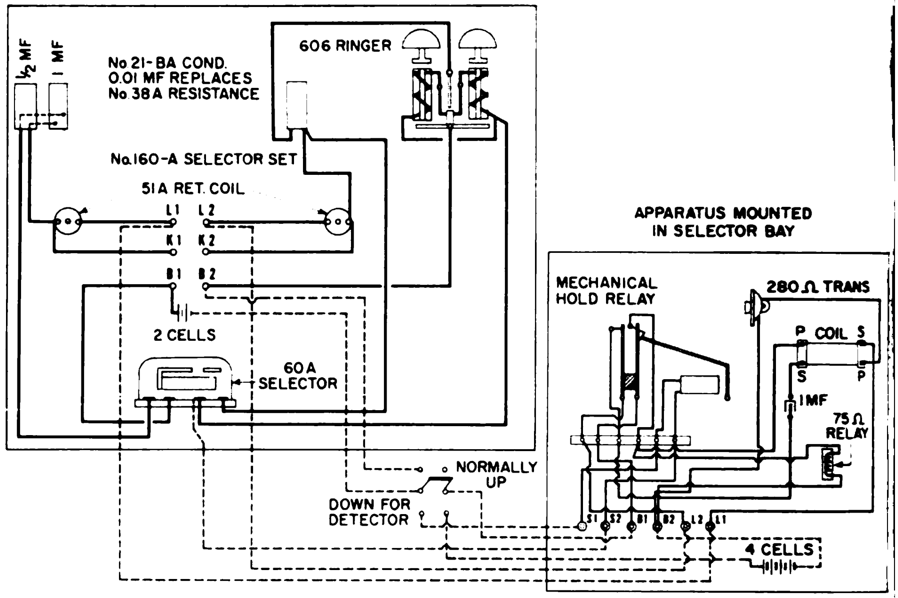
WHAT'S THE ANSWER?

(continued)

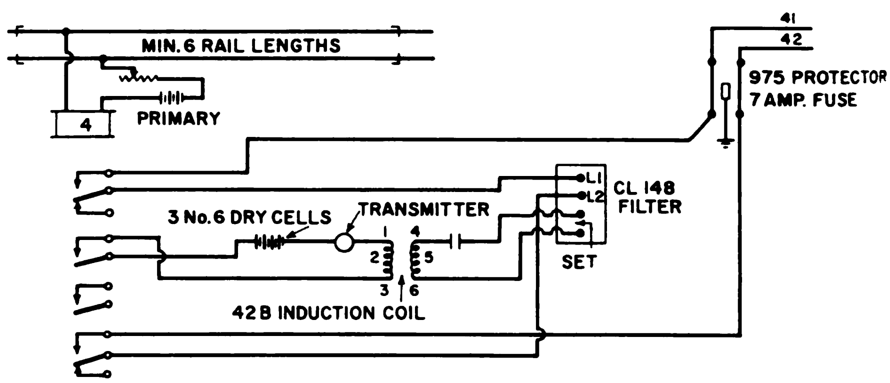
phone line. On passage of a train the sound of the buzzer, activated by the flasher relay, is heard by the dispatcher. A thermal relay is provided to cut the device out should a train stop on the track circuit.

A second type is used at locations where we have no telephone line, and is inserted in the dispatcher's Morse telegraph line. This unit consists of a 20-point stepping switch and is activated by track relays in a manner similar to the telephone unit. The switch steps continuously for a time determined by a thermal relay, and the contacts of the switch, which are inserted into the telegraph line, are strapped so as to produce a telegraph type code distinctive to each location. In this way the dispatcher can tell from what point the indication is being received. At the end of the time cycle, or when the train has departed, a control relay drops out to restore the telegraph line to normal.

A third type has been installed at one point where there were no track circuits available to initiate an indication. This consists of a small audio amplifier, the output of which can be connected to the dispatcher's telephone line by a 60 AP selector, and provided with a microphone pointing toward the track. Shortly before a dispatcher expects a train he rings up the selector, and when the train passes the point he can hear the sound picked up by the microphone and sent to him over the telephone line.



A. E. Parnell, C&S, **Figure 1:** Selector operated OS device.



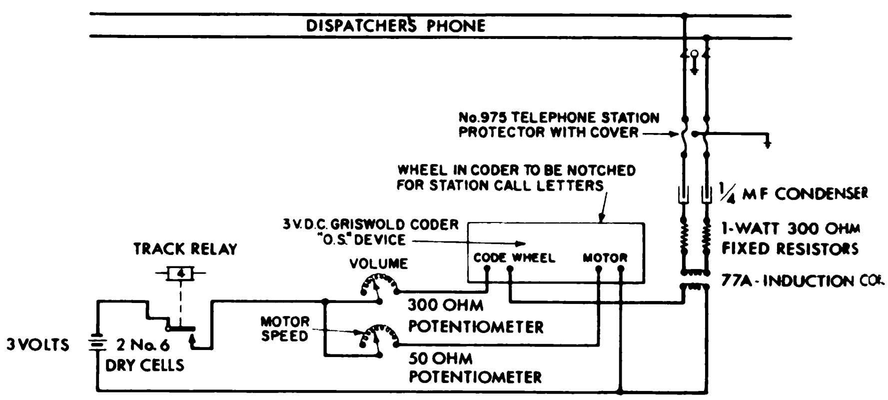
A. E. Parnell, C&S, **Figure 2:** Track circuit operated OS device.

Device Works on Dry Cells

B. F. McGOWAN, Superintendent of Signals, Soo Line, Minneapolis, Minn.

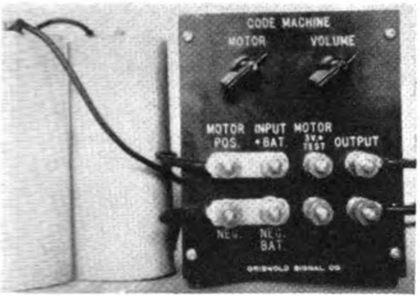
The drawing shows the automatic OS device used on the Soo Line, Wisconsin Central and Duluth, South Shore & Atlantic.

While we have used various OS devices, we have collaborated recently with the Griswold Signal Co. of Minneapolis and have designed and built, most successfully, an OS device which operates on two No. 6 dry cells, as shown in the plan. It consists of a low current, miniature dc motor, operating on 3 volts. The miniature motor has a current drain of 50 mils at full load at 3 volts dc, providing 15 rpm through an elliptical gear train, and will operate between temperature ranges of − 70 and + 185 deg F. The speed may be varied from 10 to 20 rpm by using a variable potentiometer. A code wheel is attached to the shaft of the motor assembly and is notched to provide "station call" letters of the Morse code. Six code letters can be furnished on the code wheel, i.e., "OS CX CX." This, at the 15-rpm speed, will produce 90 letters per minute. This positively identifies the passage of a train at a particular OS location.



B. F. McGowan, Soo, OS device uses 3 v motor driven code wheel.

In non-CTC territory, a single 3-rail track circuit, to which is connected a 4-ohm track relay in series with the two rails (normally de-energized), is used to indicate the presence of a train or engine through the front contacts of the relay. Direct current energy from the two No. 6 dry cells actuates the miniature motor. As the code wheel operates in continuous rotation while energized, the notches in the code wheel make and break a circuit to the induction coil. This, in turn, through suitable resistors, condensers, and telephone protectors, provides the Morse telegraph code for the station identification. If carrier frequencies are on the dispatcher's circuit, CL-148 filters are used. We have found that a train dispatcher can readily read the Morse indication accurately and it does not interfere with simultaneous conversation on the di-



Griswold Signal Co. OS device.

patcher's circuit. This OS device has been in service on our railroad for more than 13 months and appears to be superior to other types used. The two No. 6 dry cells originally installed, are still providing excellent service.

The cost of the coding device, including the motor, the potentiometer, the volume control, the induction coil, the condensers, resistors and telephone protectors is less than $150 and is all enclosed in a small case. The dimensions are 5½ in. deep (including terminals), 5 in. wide and 6¼ in. high, and weighs 4½ lb without the two dry cells (8 lb complete). It requires less space in an instrument case than a conventional 4-contact relay.

It will be noted from the photograph of the exterior view that four of the terminals are strapped when used for dc operation. If ac energy is employed, the straps are removed and the ac energy and the dc energy are properly separated.

We have installed this OS device on our railroad where an existing crossing signal track circuit has been used rather than the 3-rail track circuit previously mentioned.

Use Selector or Track Circuit

A. E. PARNELL, Superintendent Communications and Signals, Colorado & Southern and Fort Worth & Denver, Denver, Colo.

We use two types of OS devices in non-signal territory. Figure 1 shows a type of device actuated by selector and held on or removed through a special relay. A 160 type selector is used to actuate the detector. The selector is bridged across the dispatcher's telephone pair and the selector is operated by 3½-cycle ringing.

When the dispatcher makes the combination for the train detector it operates the 160 type selector, which in turn, through its contacts, sends an impulse to the grasshopper type relay, and the relay cuts the transmitter on and holds it on until the dispatcher again selects that same selector. The next impulse the selector sends out knocks off the grasshopper relay and cuts the transmitter off the line. This apparatus is controlled by the dispatcher through the conventional ringing equipment, using a 3½-cycle ringing.

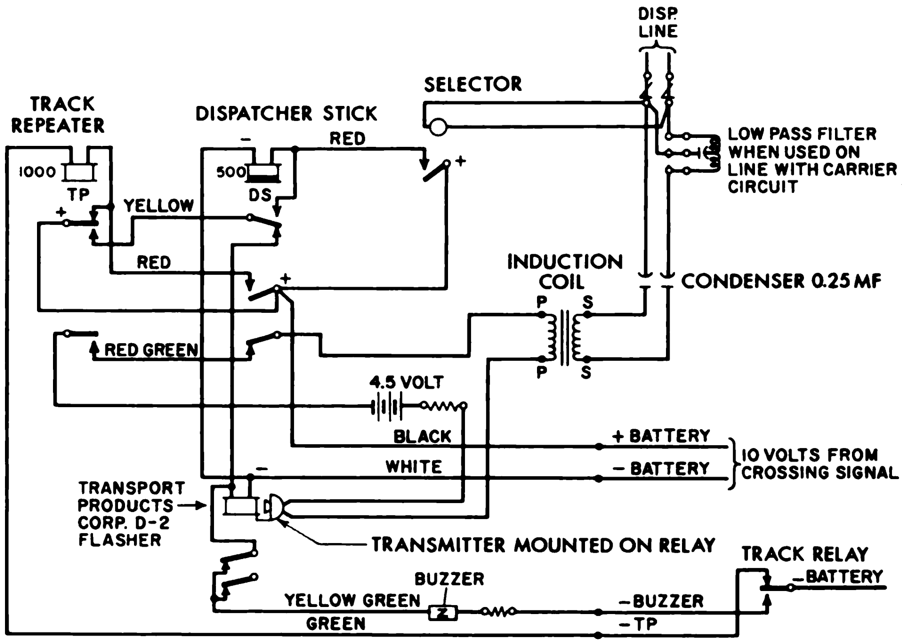
Figure 2 shows a device that is controlled through an open circuit track circuit and actuated by the train itself.

Use Flasher Relay

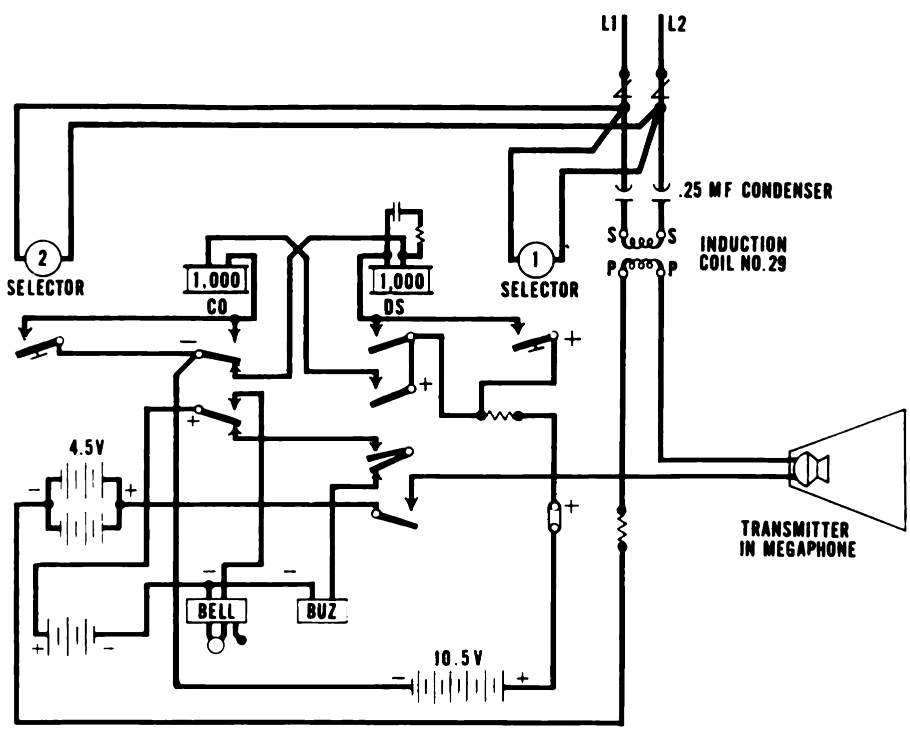
R. L. STEPHENS, Superintendent Communications and Signals, Florida East Coast, St. Augustine, Fla.

Figure 1 shows OS device in use on northbound main of double-track mainline in signaled territory. When track circuit is shunted TP relay drops, which causes flasher to operate, putting intermittent sounds of flasher relay and buzzer on dispatcher line. When the dispatcher hears this OS signal he turns key to operate selector, which picks up DS relay to stop the operation. If the dispatcher should be out of the office, the OS signal will remain on line, because it must be stopped by the operation of the selector. If the track relay has picked up, he will hear only the sound of the flasher relay operating.

Figure 2 shows an OS device in non-signaled territory.



R. L. Stephens, FEC, **Figure 1:** OS device transmits sound of flasher relay.



R. L. Stephens, FEC, **Figure 2:** Selector operated OS device