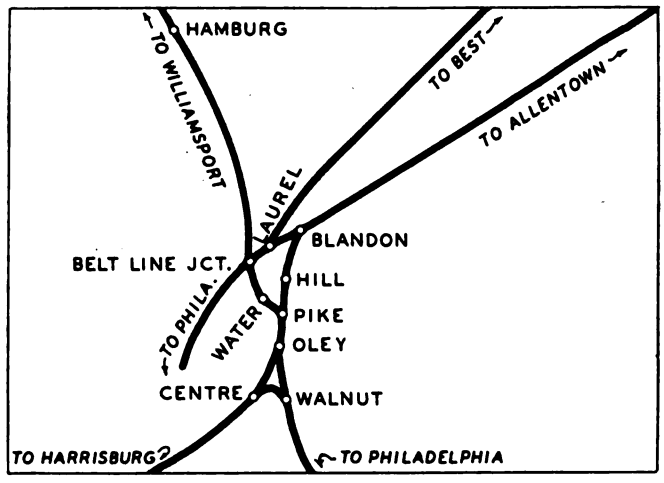
The Reading Has

Compact Control Machine

for Consolidated Interlocking

Small compact machine, all within arm's length of control operator, made possible by mounting only the controls on console panel; a separate large track diagram panel, mounted 10 ft. from console machine, being used for indication lamps to show aspects displayed by signals, position of switches, routes lined up and track occupancy



WHEN THE READING COMPANY was planning the consolidation of eight interlockings in Reading, Pa., an important objective was to obtain a machine, manufactured to Reading requirements, by means of which an operator could manipulate all the controls without leaving his chair, rather than walking along a machine of the conventional type.

What Was Simplified

This consolidation project is of the all-relay type including the entrance-exit system of controls, in which the switches are lined up and the signal for a route is cleared, merely by pushing two buttons on the console control panel, the first of which represents the signal or entrance point at which the train will enter home signal limits, and the second button represents the location at which the train will depart from those limits or exit point.

The entrance-exit system of controls has been on the market for a number of years, and numerous interlockings, using this method of control, have been installed. Up to the present, the control machines have each consisted of a large illuminated diagram which included not only the entrance and exit control buttons but also illuminated symbols to represent signals, and engraved track lines with indication lamps to repeat track occupancy, switch position and routes lined up. If these past practices had been used to construct a control machine for the interlocking consolidations now underway and proposed at Reading, the machine would have totaled perhaps 52 ft. or more in length.

When faced with this problem, the Chief Signal, Electrical and Communications Engineer of the Reading hit on the idea of placing only the control buttons on a compact console or desktype machine, and, on a larger, more remote track diagram, are panels which include the lamps which repeat signal aspects, track-occupancy, switch position and track line ups. Plans and an experimental cardboard "mock-ups" of the panels and diagrams were made and, with the cooperation of the engineers of the General Railway Signal Company, the equipment was designed and manufactured. This machine approaches the practical ultimate in compactness and arrangement for control of extensive consolidations of interlockings, placing the controls within easy reach of operator seated at the console machine. The idea, therefore, may see wide application on numerous railroads who are planning interlocking and traffic control consolidations.

Only Buttons on Control

The unique feature of this Reading idea is that the control machine panel located on the console includes only buttons. These buttons are made of colored plastic with letters inserted in the center, each interlocking distinguished by using a color, the letters and color correspond on the console and remote model-board, thus the operator can easily associate operation and movements between these two points. This permits the use of small panels arranged in a semi-circle to form a con-

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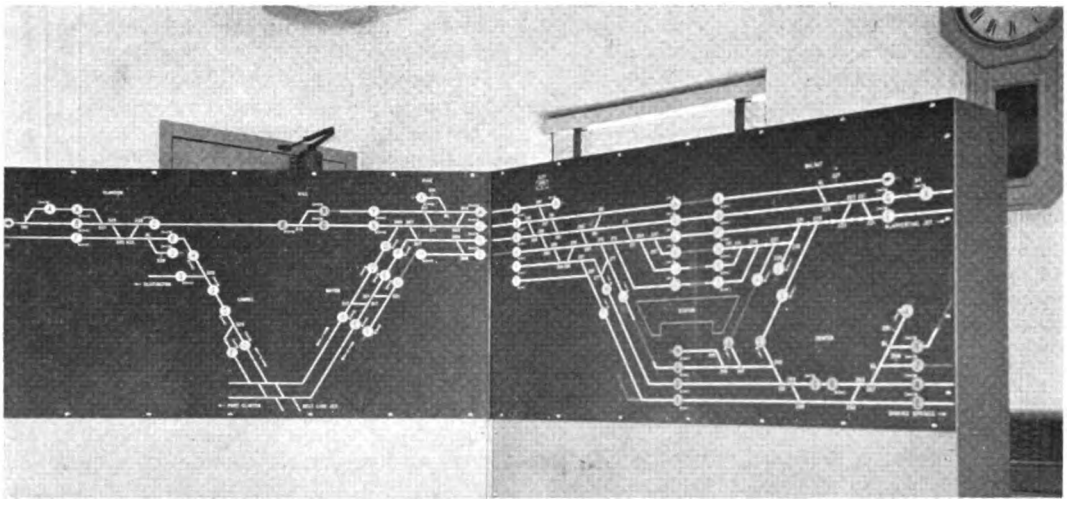
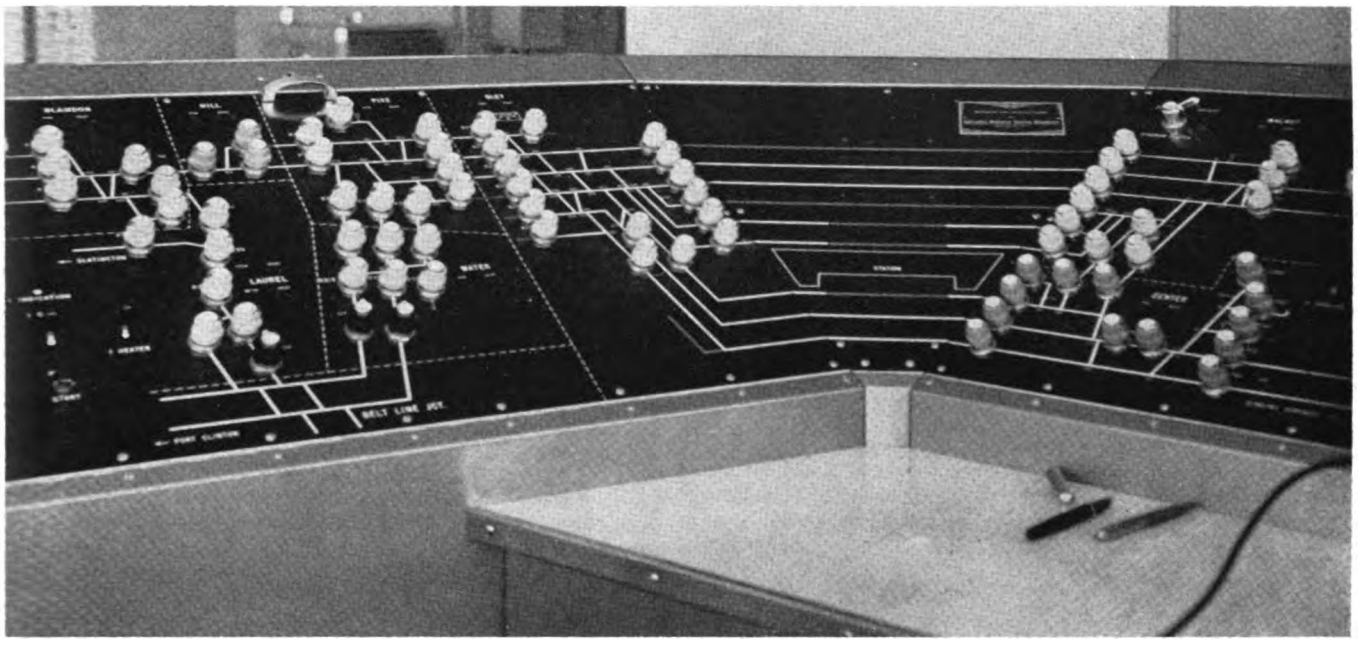
Because you, as readers, may want to know about this new interlocking control machine as quickly as possible, I arranged to be in Reading as soon after the first unit was placed in service. I made these pictures and wrote this article, which was promptly checked by the railroad—thus enabling us to bring you this information promptly. Projects now under way on other railroads are to include novel ideas, too, and therefore, we have decided to publish articles in a series which could be titled "Modern Systems of Signaling Controls and Circuits." In the series, this Reading article is No. 1; watch for two or three more later in 1955 and in 1956.

John H. Dunn, Editor



THIS ILLUMINATED TRACK diagram is mounted on pedestals 10 ft. from the . . .



CONSOLE-TYPE interlocking control machine which has control buttons all within arm's reach

sole, all sections of which are within arm's reach of a man seated at the center.

The sections of the control panel are on a slope of 30 deg., the length up the slope being 18 in. This 18 in. affords sufficient area that the groups of control buttons for the eight different interlockings are placed somewhat in accordance with their respective geographic locations. Therefore, one section of panel 28 in. wide at the bottom, and 18 in. high up the slope, includes 8 buttons for the Blandon interlocking; 3 for Hill; 6 for Laurel; 6 for Water; 10 for Pike; and 16 at Oley, a total of 48 signal buttons, on a panel 28 in. wide and 18 in. high.

The next panel includes 13 signal buttons for Walnut and 13 for Centre. Thus eight interlockings including a total of 26 single switches, 27 crossovers and 78 home signals are controlled from signal buttons which are mounted on a total of 56 in. of panel length, measured along the bottom. When the present project, including the eight interlocking machines, is completed, only about half of the console panels will be in use. The other panels, which are now blank, are reserved for control of other interlockings, in this same general area.

The manipulation of this control console is simple. The buttons are arranged so they are to be pushed in for normal operation, pulled out to cancel route, turned up for fleeting movements, and turned down for restricting or follow-up moves. Any button will serve either as an "entrance" or an "exit" button, depending on the direction for which the signal is to be cleared over an established track line up.

Manipulation Is Easy

If an approaching train is to enter an interlocking such as Walnut at "C" and depart at exit "M," the operator pushes the buttons "C" and "M" in succession. When button "C" is pushed to initiate the route, the opal light in the barrel of the button flashes. Lights will also flash in the buttons of all available exit points. When button "M" is pushed, the lights in buttons "C" and "M" change to steady burning opal. Flashing lights in all the other available exit points go out. When the route is completed, the light in button "C" changes to steady burning red, while the light in button "M" remain steady burning opal.

The second feature of the Reading idea is the large size illuminated modelboard showing the track diagram consisting of several sections, each 2 ft. high and 4 ft. wide, mounted on pedestals 29 in. high, in a semicircle, the radius of which is 10 ft. from the center where the operator's chair is located at the control console.

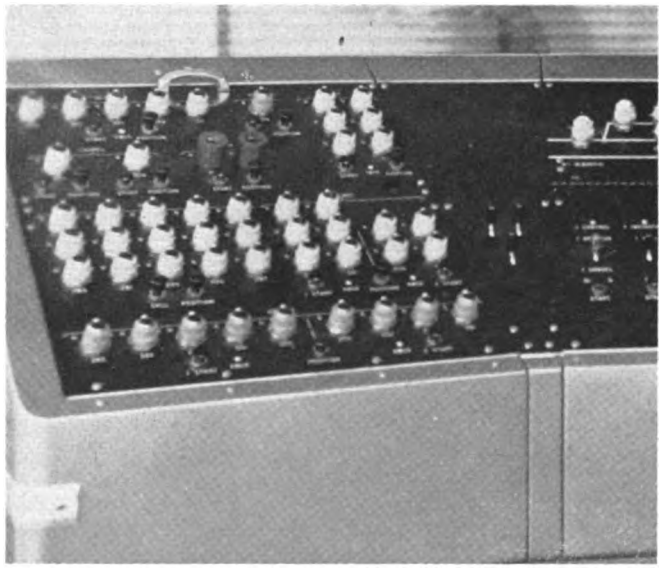
Model Board Diagram 10 ft. Away

The surface of the modelboard panels are non-reflecting black, on which ¼-in. engraved white lines represent the track layout, including crossovers, switches and symbols indicating signals. In these white lines, representing track layout, are red lamps which are lighted when corresponding sections of track are occupied by trains, and opal lamps to indicate the route lined. In the portion of the diagram which represents each turnout or crossover, there are switch repeater lamps. When a line-up is being established, these switch repeater lamps are flashed opal at the rate of 40 times per min. When the switch is operated to the position called for and is locked, the lamp changes to steady burning opal and, along with the opal route lamps, forms a point-of-light indication to show the route lined up. Also when the signal clears, the normal red indication lamp in the symbol for the signal is extinguished, and a green lamp is lighted.

When the train accepts and passes the signal, the indication lamp in the signal indication changes from green to red, the red track occupancy lamps light and the opal route lamps extinguish as the movement of the train progresses through the home signal limits. On the console control panel the lights in the entrance button and exit button are also extinguished when the train passes the signal.

Separate Test Panel

At the left end of the console control panels there is a special panel on which are mounted the test keys, one plastic colored button corresponding with each switch and each crossover, using the same color combinations as in interlockings on console and modelboard. These buttons are for individual control of switches when the maintainer is cleaning and testing the switches. Also this special control can be used to line up switches for special routes not called in the control system.



THE TEST PANEL is at the left end of the console

Communications facilities are included in the console machine and consist of several talkback speakers with foot pedals serving three train dispatchers, chief dispatcher, inter office, yardmasters and yard phones. The speakers are connected to circuits at all times, making it necessary for the operator to only operate the proper foot pedal to answer calls. Selective switches are included to be used when required to avoid interference.

A Year to Complete the Job

The first phase of this project was changes at Walnut interlocking where a 10-lever mechanical machine was replaced by electric switch machines and searchlight signals that are controlled from the new "console" type machine which is located in Oley Tower, a new concrete building just north of the tracks and west of the outer passenger station, Reading. This phase was completed August 6. The second phase will include

	Single Switches	Single Switch With Pipe Connected Derail	Crossovers	Home Signals
Oley	5	0	11	16
Pike	1	1	4	10
Walnut	9	1	2	13
Centre	6	2	2	13
Water	0	0	2	6
Laurel	2	0	0	6
Blandon	1	1	2	7
Hill	1	0	0	3

(1) necessary track and signal changes at Belt Line Junction, (2) the installation of power switch machines, and signals, with code and traffic control equipment at Blandon and Laurel which are the two ends of a new low grade freight cutoff, and at Hill which is the new end of single track traffic controlled operation where second track was removed between Hill and Blandon. The final phase will include Pike, Centre and Oley, to complete the project, with all controls centered in Oley tower.

The present electric interlocking at Oley, which has 59 working levers, has been in service since 1911. Centre and Pike are mechanical plants that will be replaced by new switch machines and light type signals and with all controls in the new machine at Oley. Some track changes, including the installation of longer crossovers, are to be made in some of these track layouts. This track work and the interlocking construction work are being coordinated and programmed so that the entire project, with all the eight interlockings controlled from the one new push button machine, should be completed within the coming year.

This interlocking project was planned and is being constructed by Reading forces under the direction of G. B. Blatt, Chief Signal, Electrical and Communications Engineer, the major items of code and interlocking equipment being furnished by the General Railway Signal Company. Circuit engineering is by J. E. Hillig, Signal and Communications Engineer, and construction work is under supervision of E. L. Rogers, Supervisor of Signals.