

New power switch machines and searchlight signals replace the old mechanical interlockings

## Lehigh Valley Combines Interlockings

**Modern all-electric equipment with panel type control machine replaces two old mechanical plants, thus saving train time and reducing the operating expenses at important junctions**

AT COXTON AND PITSTON JCT., PA., the Lehigh Valley had two old mechanical interlockings which were located in the areas marked "A" and "B" on the plan herewith. In order to improve the operation and reduce expense, these old mechanical interlockings were removed and new electric switch machines and color light signals were installed, all of which are combined in one new all-relay interlocking controlled from a miniature-lever type control machine.

At Coxtion there is a junction between the double-track main line and the mountain cut-off which extends to Gracedale interlocking, a distance of 20 miles. Gracedale interlocking is the junction of the main line and the east end of the mountain cut-off. This cut-off is used by all through freight trains and one passenger train daily. All other passenger trains and some local freights use the main line via Wilkes-Barre, Pa. Coxtion is a division point for freight trains, the yard being located on both sides of the main line west of location marked "A" on the plan.

The daily traffic through Coxtion includes 10 passenger trains and approximately 28 through freight trains, in addition to several local freight and switching moves.

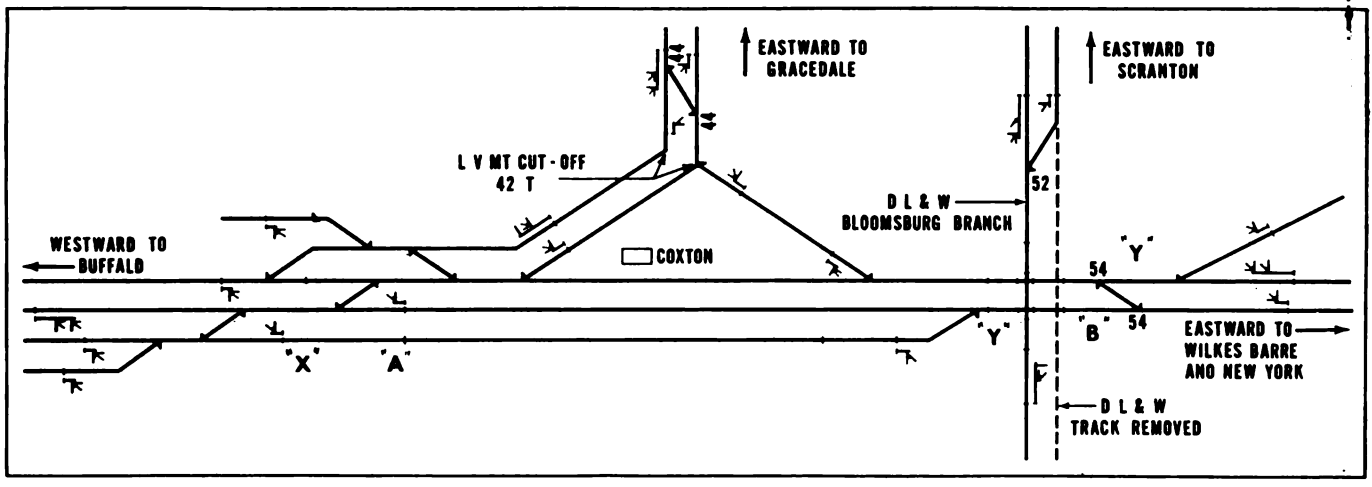
As part of the improvement program, some track changes were made. Crossover 44 on the cut-off, was previously not included in the interlocking. It was operated by hand-throw stands which resulted in train-stops and delays. This crossover is now included in the new interlocking.

### **Crossing Included**

The Bloomsburg branch of the Lackawanna crosses the Lehigh Valley as shown in the plan. One of the previous mechanical interlockings, marked "B", included this railroad crossing as well as several switches and crossovers in this area. As part of the program, the eastward main track of the Lackawanna was removed throughout the crossing area and east for approximately one-half mile, thus leaving the track layout as shown in the plan.

Two old wood frame interlocking towers were removed. The new panel-type interlocking machine is in a new one-story building, 20 ft. by 24 ft., built of cinder block with stucco finish and, located as shown on the plan herewith. The panel of the control machine is 18 in. high and 40 in. long. The face of this panel is a sheet of transparent plastic  $\frac{1}{4}$  in. thick, with holes bored for levers and indication lamps. The 10 signal levers, are in the top row, with indication lamps above each lever. The 14 switch levers are in the bottom row, with normal and reverse indication lamps above each lever. When electric locking is in effect to prevent the operation of a switch, a red "lock" lamp is lighted in the face of the barrel of the switch lever so affected.

All the signals on this project are the color light type. The track relays are type K, 4-ohm relays with a 16-ohm relay also used on track circuits outside of interlocking limits. To improve shunting, a primary-secondary track relay arrangement is used on all interlocking track circuits. Timing relays, which op-



erate more than 30 seconds, are the motor-driven type, but for shorter operation the thermal type is used.

Most of the track relays, control relays, etc. are located in large-sized sheet-metal bungalows in central areas "X" and "Y", as indicated on the plan. This "zone" practice of locating equipment reduces the amount of wire and cable needed, compared with locating this apparatus in the one control building.

The main batteries for the 24 volt switch machines each consist of 21 cells of 160 a.h. Edison nickel-iron storage battery. These batteries are located in battery boxes at locations "X", "Y" and at cross-over 44. Each track circuit is fed by two cells of 160 a.h. Edison storage battery.

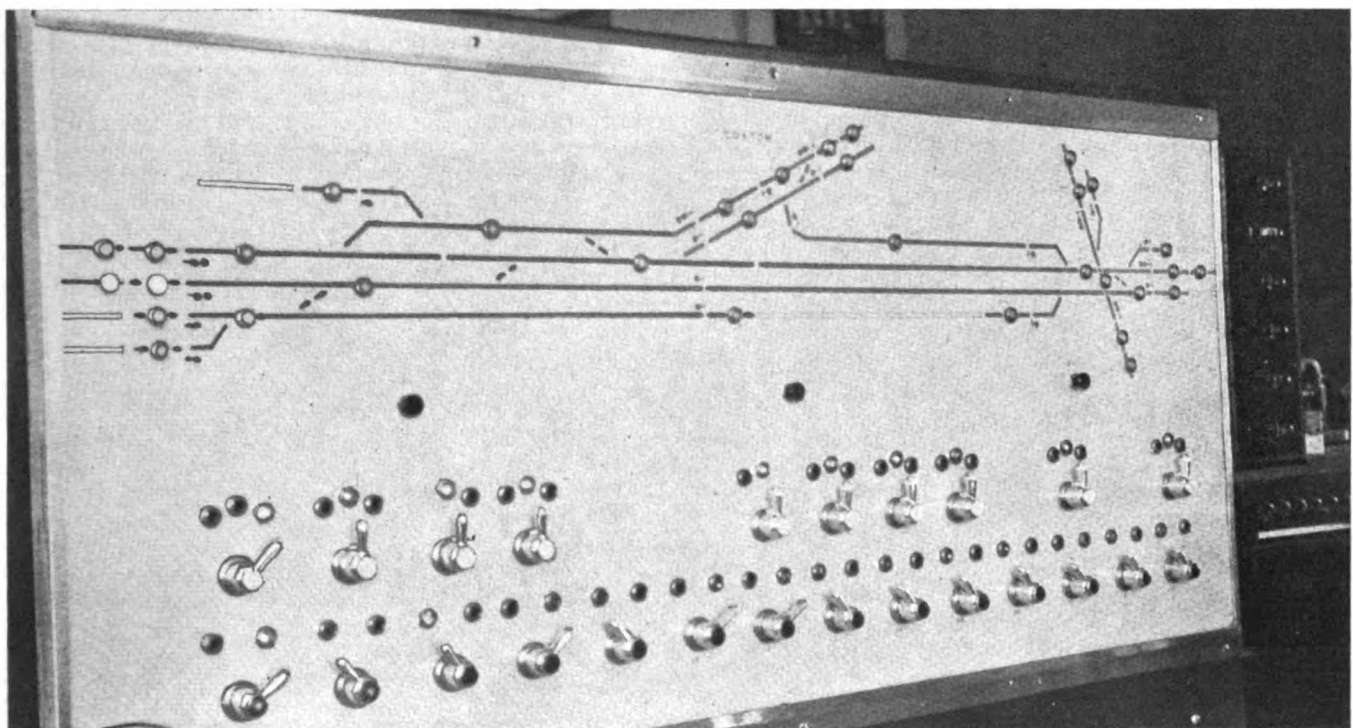
The switch machines are the model 5D, 24 volt. The control circuits from the battery to the switch machines are on No. 6 wires. The wires, which are in buried cable, are brought up through a riser to terminals in a junction box near each switch machine. From these terminals, flexible No. 6 wires extend through rubber conduit to the machine. This construction minimizes wire breakage.

Each switch layout includes three 1½ in. by 8 in. insulated gauge plates on the No. 0, No. 1 and the No. 2 ties. Adjustable rail braces are used on these plates, including braces on the gauge side on the No. 0 tie. On two ties the plates extend and are attached to the switch machine, thus insuring the position of the machine with respect to the rail. Each switch is

equipped with a propane gas switch heater.

The trenches for the buried cables were dug by a power ditching machine, owned by the Lehigh Valley. This machine digs a ditch 10 in. wide and 3 ft. deep.

This interlocking project was planned and installed by Lehigh Valley forces under the direction of J. F. Yerger, chief engineer-signals and communications, and C. F. Nelson, signal construction engineer. The sheet-metal instrument houses, relay cases, battery boxes and control machine were constructed and wired in the Lehigh Valley signal shop at Sayre, Pa. The switch machine plates and precast concrete foundations were also made at Sayre. The remaining items of equipment were furnished by General Railway Signal Co.



Two previous interlocking areas are now controlled by this one panel type machine