

# Remote-Control on the Seaboard

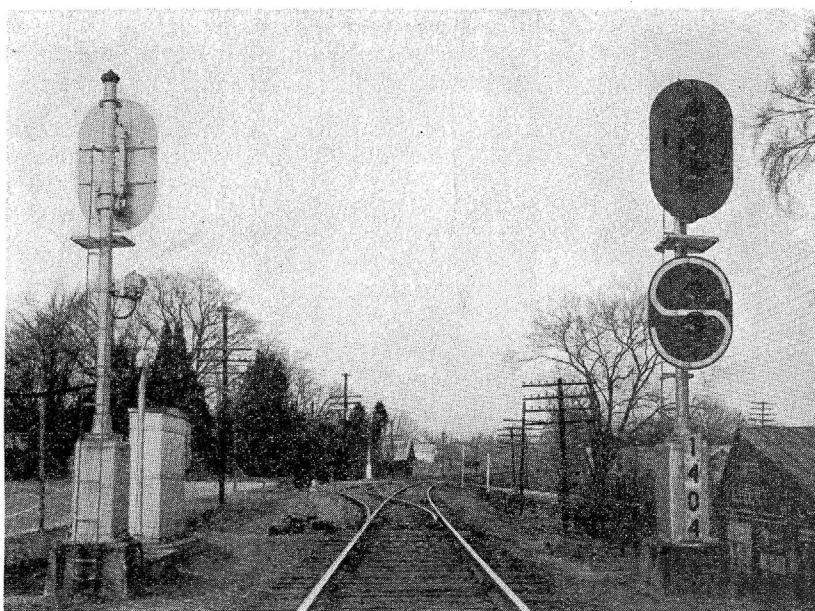
Installations of power switches and signals at  
10 passing sidings on single-track  
effect savings in train  
operation

DURING 1930 AND 1931, the Seaboard Air Line made 10 installations of remotely-controlled power switch machines with signals for directing train movements at one or both ends of 10 passing sidings in single-track automatic block signal territory. These installations have now been in service a sufficient length of time to show considerable economy in train operation by increasing average train speeds and eliminating train stops.

Both the engineering and installation of these projects were handled by the railway's signal department forces, several unique arrangements of circuits and signals being incorporated.

## Southern Pines Installation

The remotely-controlled installation at Southern Pines, N.C., is more or less typical of the 10 projects and will be explained in some detail in this article. The passing siding at Southern Pine is about 9,000 ft. long, both ends being situated such that when stopping to enter the siding a large portion of a train is on a 1 per cent ascending grade. The delays occasioned by the grade conditions at these locations were numerous. In some instances the train had to be cut in two and doubled into the siding, or, in other cases, the train had to be held at some other point on the line so as not to be required to use the siding at Southern Pines.

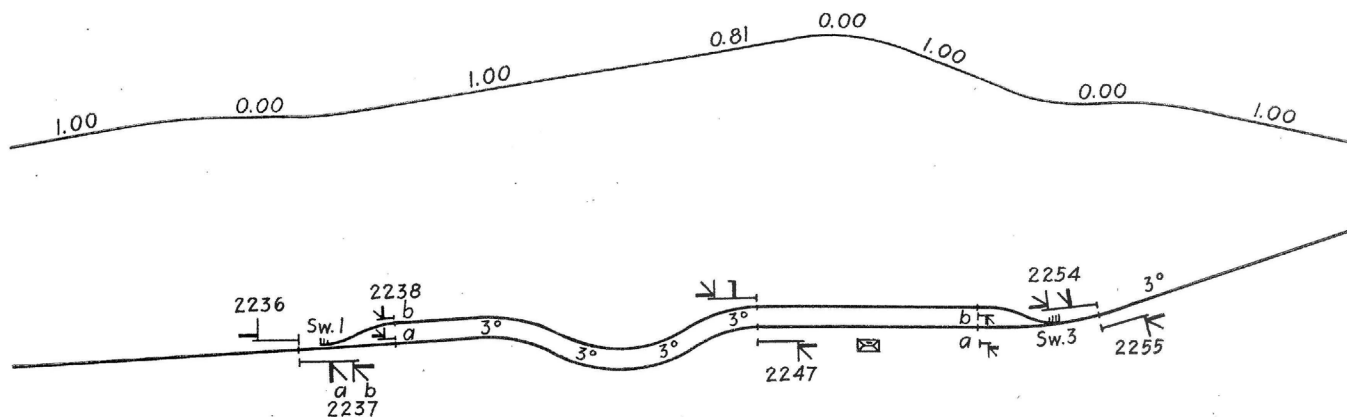


Power switch and signals at Wake Forest

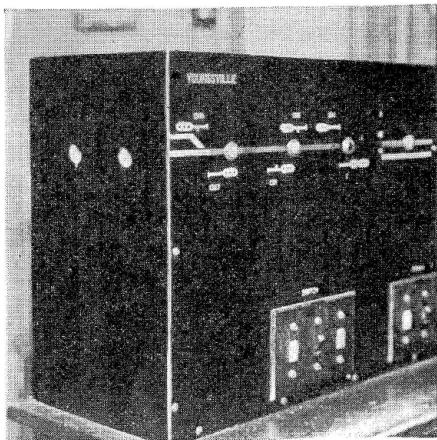
This single-track territory is equipped with a-c. automatic block signaling using the Union Switch & Signal Company A.P.B. control system. After considerable discussion, it was decided to let the head-block signals, both for entering and leaving, remain in place, the signals to be added at each end of a siding layout to include a three-aspect searchlight-type dwarf at the fouling point on the main line, a two-color color-light type dwarf located on the siding to govern trains leaving the siding, and a two-

color, color-light unit added as a lower arm on the high signal, to govern train movements when entering a siding. This additional unit displays yellow under a red of the top unit, to indicate "take-siding." The entering signal and the dwarf leaving signal are under the control of an operator, while the leaving head-block signal is fully automatic, the operator having no direct control of this signal.

A special feature is that a series relay of the ANL-2 type is connected in series with the lamp in the search-



Track and signal diagram of Southern Pines installation



Control panel with diagram

light dwarf signal, and the "H" control of the leaving or head-block signal is broken through this relay so that if the lamp in the dwarf signal should fail, the leaving signal will indicate red.

### A-C. Switch Machines

The power switch machines are the Model-M-20 equipped with dual control selectors and provided with a motor for operation on 110 volts a.c. Each switch machine is controlled by a Type-F controller. A 5.1 amp. thermal relay, set at 10 seconds, will cut out automatically if the motor is overloaded on account of the switch being obstructed.

The switch machines are operated by 110-volts a-c. taken from the line supplying the a-c. automatic signals on this territory. The d-c. control circuits are fed from rectifiers. This type of power supply for this remote control installation was considered practicable on account of the fact that the a-c. supply is reliable. In case of an a-c. power outage, or if a switch machine is out of order, the switch can be operated by a trainman by use of the dual-selector. In this case, instructions direct the trainmen to call the operator; a telephone at each switch is connected by a special line circuit to a phone at the office. If the operator gives permission to use the switch, the trainman operates a clock-work release at the switch. When the release is operated, all signals are set at "stop" and after a 1½-minute interval, when the release is run down, the switch will operate if a-c. power is available. If not, the trainman can use the dual-selector lever to operate the switch.

Each switch layout is equipped with ¾-in. by 7-in. tie plates with butt blocks and riser plates welded on. Racor adjustable rail braces are used, braces being located on both the inside and outside of the rail on the

tie ahead of the point. The points are equipped with Racor compensating switch clips.

### Control Machine

A desk-type control panel in the operator's office consists of a sheet-metal cabinet, on the face of which is an illuminated track diagram, and the switches which control the circuits are mounted inside the cabinet with the handles extending through the face of the cabinet to act as levers. A double-pole, or four-way snap-switch is used to control each two-wire switch line-control circuit extending to its corresponding Type-F controller at the switch. A single-pole double-throw snap switch is used for each signal lever to control a neutral circuit. The signal to be cleared is selected through contacts of the KR switch-repeater relay at the switch.

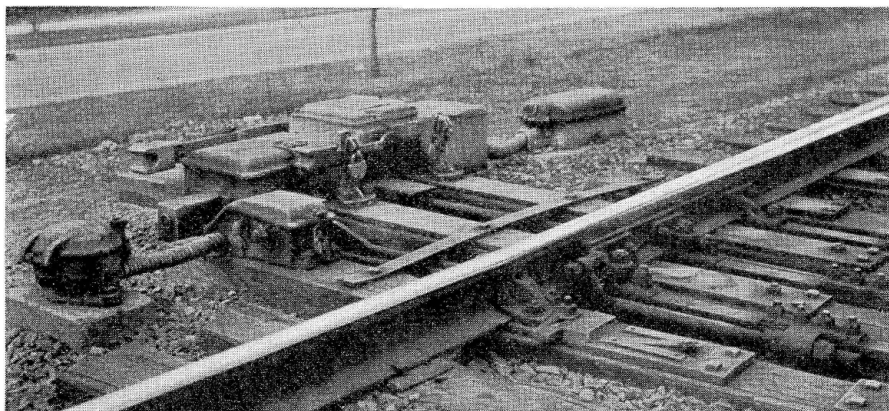
Complete information shown by the lamps includes indications as to when a train leaves the next siding, enters the approach-locking circuit, passes over a power-switch layout, and when it occupies the section of the main line between the passing-

transformer to 10 volts to feed the 12-16-volt track model lamps.

For reasons of economy, many of the relays used for control circuits are of the d-c. type, energy being obtained through copper-oxide rectifiers. Also the searchlight dwarf signals are of the d-c. type. The Type-F controller on each power switch layout is wired "stick," obtaining energy through its own front contacts and the contacts of the detector track relay, thus assuring that the controller will retain its position while a train occupies the detector section.

Full approach locking, starting a minimum of 3,000 ft. back of the next approach automatic signal, is incorporated, being so designed that the position of the switch cannot be changed after the signals are once cleared with a train approaching, until the train is stopped and some member of the crew operates a 1½-minute time release, located in a box.

Time locking is obtained on the siding by the use of a time-element relay. The circuits for some installations are arranged to provide fully automatic operation of signals so that the station may be unattended during certain periods. At other locations,



The switch layouts are solidly constructed

track switches. The position of each switch is indicated by a circuit controlled by the switch-repeater KR relay, and the aspect of each signal is also indicated by a separate line circuit.

The control circuits are of the direct-wire type, this being the most economical method considering the distance and the fact that the existing separate signal pole line was heavy enough to carry the additional 12 to 14 wires to each switch layout. The line wire used is No. 10 AWG bare Copperweld.

The switch-control line circuits operate at 110-volts a-c., while the signal controls are 10 volt d-c. circuits. The indicator line circuits are 110 volts a-c., each circuit being stepped down at the office by a bell-ringing

like Southern Pines, the signals are wired "stick" so that the operator must restore the signal "lever" after each train movement.

The instruments at each switch layout are housed in a large wooden instrument case of the railway's design. These cases are reinforced by steel bands around the case and are equipped with a heavy inverted T-iron base, mounted on concrete foundation. The wire runs from cases to switches and signals are in bronze-taped parkway cable, and track-circuit leads are in fiber-taped, jute-covered cable.

The signals, relays, transformers, etc. used on these remotely-controlled installations are of the Union Switch & Signal Company manufacture, and the wire and cable are Kerite.