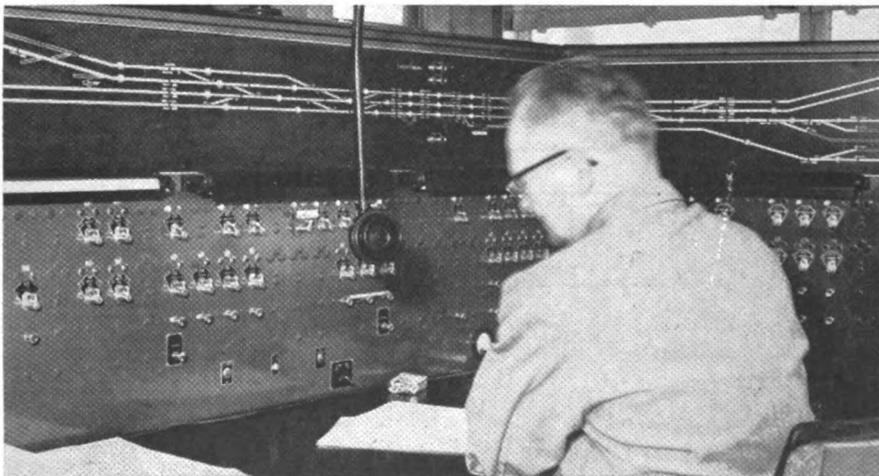




One Machine Controls Two Plants

C & O consolidates interlockings involving one remote electro-pneumatic plant at Ashland, Ky., yard entrance and replacement of a mechanical plant at Big Sandy Jct. Control machine in new tower at junction ("BS" cabin)



BS Jct. interlocking is controlled by direct wire and Clyffside by a time code system. Eastward home bridge at Clyffside (signal 112R) shown above

THE CHESAPEAKE & OHIO has consolidated the control of two interlockings into one remote control plant, known as "BS" cabin, near the Kentucky-West Virginia border along the Ohio River. The main line is three-track both east and west of BS—with a two-track bridge over Big Sandy River just east of BS Jct. The east-west mainline and the double-track Big Sandy subdivision join in an interlocking about 700 ft. long at Big Sandy Jct., and form a three-track line which runs west for three miles to Clyffside interlocking. Here, the three tracks expand into four; the southward pair are the passenger mains and the northward pair are the freight mains.

Also at Clyffside, the passenger



mains leave the freight mains and swing south through Ashland on a separate route, rejoining the freight mains west of the city. Clyffside is at the east end of Ashland freight yard. When the new "BS" cabin interlocking was placed in service, interlocking limits and interlocking rules at Clyffside and Big Sandy Jct. were suspended, and block signal rules were placed in effect governing movements of trains in either direction on one or more tracks.

Seventy-eight trains and numerous switching movements pass through "BS" cabin interlocking each day. The majority of this traffic is West Virginia and Kentucky coal being moved westbound to the C&O's large coal classification yard at Russell, Ky. (4.5 miles west of Ashland). For example, of the 40 mainline freight trains, 14 average 160 loaded hoppers moving west and 14 are trains of empties moving east. Big Sandy subdivision

(coal line south into Kentucky) freights average nine coal trains northbound and nine trains of empty hoppers southbound. Other traffic through "BS" includes four mill runs each way daily and five passenger trains each way daily.

New Tower and Control Machine At Big Sandy Junction

The interlocking at Big Sandy Jct. was a mechanical plant consisting of seven crossovers and one turnout switch, which were in need of extensive repairs. After making estimates for repairs and the cost of replacement with a modern all-relay plant with power switches, a decision was made to install the new relay interlocking and build a new one-story brick tower. Colorlight signals, in service with the mechanical plant, remained unchanged in the new interlocking, which is now controlled by direct wire.

Clyffside was a locally controlled electro-pneumatic plant consisting of eight crossovers, four turnout switches and associated colorlight signals. To effect economies in operation, as well as expedite train movements in this area, the controls of Clyffside interlocking were included in the new control machine at "BS" tower. These controls are the Union 506A time code control system, including one LCS unit and 12 storage units at Clyffside.

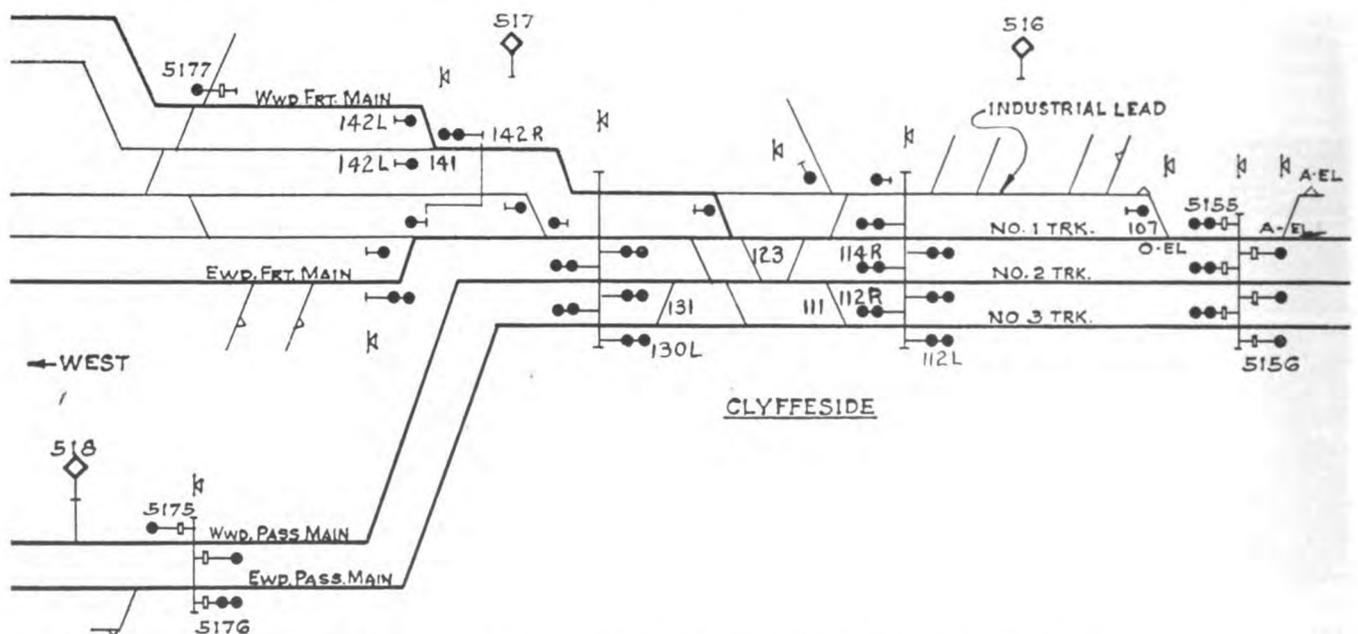
"BS" tower is located between the mainline and Big Sandy subdivision tracks, near their junction. This air-conditioned, one-story brick tower has washroom facilities,

a relay room and the operator's room containing the interlocking control machine. The control machine panel has the conventional track model diagram showing locations of switches and signals with their associated indication lamps. Traffic indication lamps are mounted on the track diagram to show the direction of traffic on tracks 1, 2 and 3 between the westward home bridge at Big Sandy Jct., and the eastward home bridge at Clyffside (3 miles away). Two other traffic indication lamps for tracks 1 and 2 are on the diagram near the approach sections to Big Sandy Jct. on the mainline. When one of these lamps is illuminated, "BS" leverman can't clear a signal for an eastward movement from "BS" to "KV."

Flashing Indication Lamps for Switches and Signals

To remind the leverman of the position of a switch at Clyffside (switches 107-141 inclusive) the switch indication lamp will flash when the switch lever is not in agreement with the switch position and the code starting button is pressed. The indication lamp will continue to flash until an indication code is received, informing the leverman of actual field conditions.

Signal control storage is provided at Clyffside for signals 112 to 142 inclusive. If a control to clear a signal is stored, and the signal lever is returned to the normal position without coding, the red signal lever light will flash. The leverman must



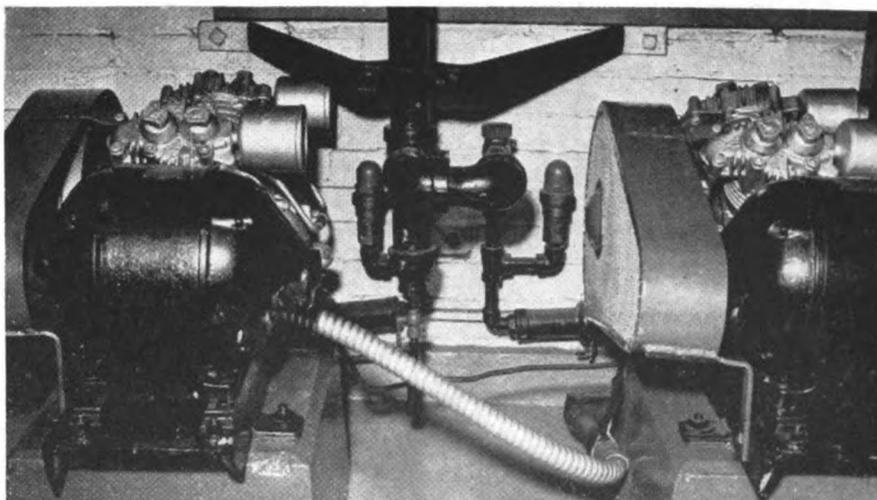
Electro-pneumatic interlocking at Clyffside was locally controlled and mechanical plant at "BS" junction was replaced with new all relay interlocking. Both plants are now controlled from one machine at "BS" cabin

code the signal to stop before this route can be changed and the flashing-light notifies him of that fact.

A time-running indication is also provided on the machine. When a signal is operated to "stop" with the approach occupied, a time interval elapses before the route can be changed. If the signal lever is normal during this time interval, the red lever light will flash. If the signal lever is not normal, the red lever light will burn steady. The flashing indications on the control machine panel are provided by a code transmitter set to operate at 60 times per minute.

Call-on Buttons for Special Moves

Below each signal lever is a call-on button, which is operated when lining up special moves. (Below the signal levers for Clyffeside signals, are two buttons; one is the call-on, the other is the code-starting button.) Call-on buttons are operated to display a signal for a westward movement to the eastward passenger main or eastward freight main at Clyffeside (clear signal 114R for a route over crossover 123 reversed or 131 reversed). To run an eastward train on the westward track of the Big Sandy subdivision, the call-on button must be operated to clear signal 96L for a route over crossovers 97, 95, 85 and 81 normal as well as switch 91 normal. Call-on buttons are also used



Two compressors supply air for electro-pneumatic switches at Clyffeside

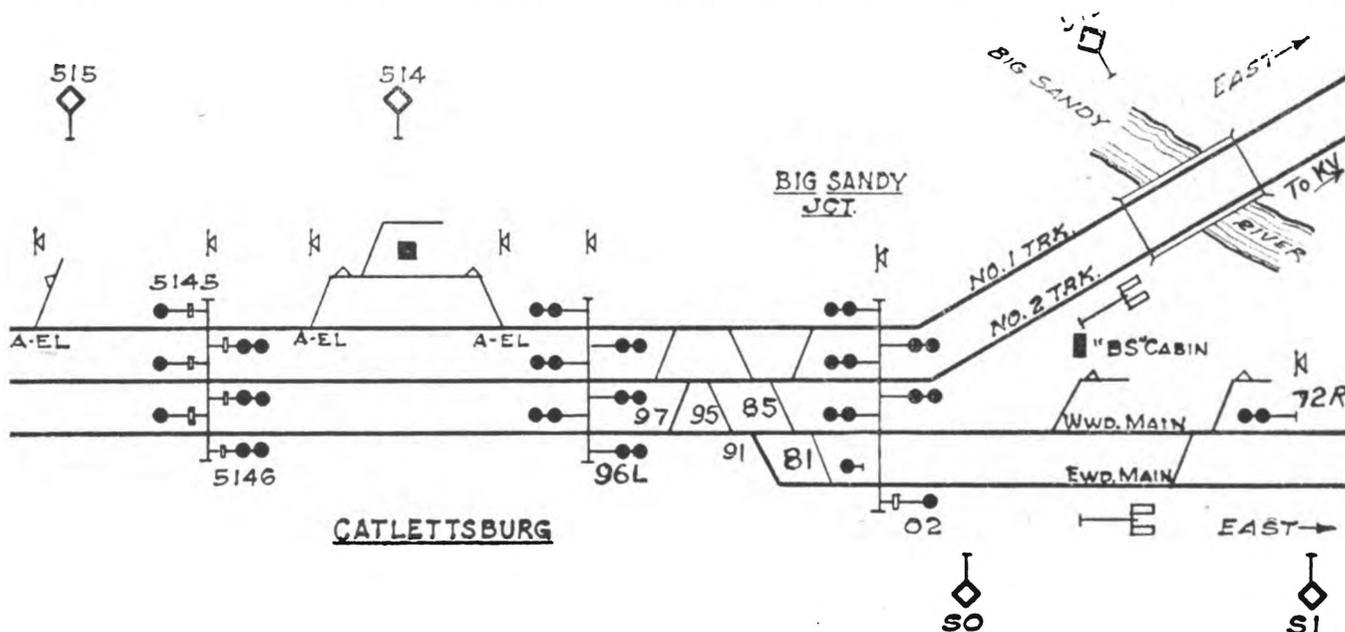
when clearing signal for "run-around routes." For example, to clear signal 130L for a run-around route over crossovers 131 and 111 reversed, the call-on button beneath the signal lever is pressed and held until the code control action has been completed.

In accordance with C&O practices, a two-wire telephone block line extends from "BS" tower (signal 72R) to Ashland yard entrance (signals 142L). Phones in wood boxes are located near home bridges, crossover layouts and electric lock locations. Maintainer's call horns, mounted on home bridges, are controlled from the control machine. When a main-

tainer hears one of these horns sound, he goes to the nearest telephone box and calls the tower.

As part of this project, new electric semaphore train-order signals were installed at "BS" cabin on the mainline and Big Sandy division. These are controlled by levers on the control machine panel, above which are indication lamps to show their positions.

Engineering and installation was done by C&O signal department forces under the jurisdiction of T. L. Carlson, superintendent of signals. The major items of signal equipment were furnished by the Union Switch & Signal Division of Westinghouse Air Brake Co.



A-EL— AUTOMATIC ELECTRICALLY LOCKED SWITCH
 O-EL— ELECTRICALLY LOCKED SWITCH OPERATED BY THE OPERATOR