

Control machine for Bay City Junction Interlocking

Remote Control Interlockings Improve Terminal Operation

Michigan Central installs power switches and searchlight signals at two junctions in Detroit; each being controlled separately by CTC-type machine and controls from existing interlockings

AT TWO JUNCTIONS in its Detroit terminal area, the Michigan Central has installed remote control interlockings, consisting of power switches and searchlight signals, CTC-controlled from two existing interlocking towers. The main line of the Michigan Central runs west from Buffalo, N.Y. to Chicago, Ill. From this line, a double-track line runs north to the north limits of Detroit, and thence, as single track to Bay City, Mich. and Mackinaw City further north. This line is known as the Bay City branch, and the point of departure from the MC main line is known as Bay City Jct. A line of the old NYC runs from the Bay City branch at Vinewood Avenue (in Detroit) southward across the MC main line on to River Rouge, Mich. This crossing of the old NYC and MC main line is called West Detroit and is about 2,000 ft. west of Bay City Jct.

One of the new interlockings consists of the switches and signals at the junction of the New York Central and Bay City branch of the MC at Vinewood Avenue, which is controlled from a panel machine from the tower at West Detroit. The other new interlocking is the group of switches and signals at the junction of the Bay City branch and the main line of the MC at Bay City Junction. This interlocking also includes a wye and associated side tracks from the Bay City branch and the MC main line. This interlocking is controlled from the present tower at Bay City Junction.

Vinewood avenue and Bay City Junction previously consisted of hand-throw switches operated by switch tenders, and electric semaphores or searchlight signals. Train operation was by signal indication, and hand signals from switch tend-

ers. Now train operation is by signal indication, being within interlocking limits. Outlying hand-throw switches on the main tracks are now equipped with electric locks controlled by the tower operator.

Heavy Traffic Area

Daily traffic on the MC main line consists of 33 passenger trains, 7 symbol freight trains and 80 miscellaneous runs (local freights or drags) which does not include switching movements. Bay City branch line traffic at this interlocking includes passenger trains, 4 symbol freights and 40 miscellaneous runs, as well as numerous switching movements. A car washer is located on one of the side tracks on the Bay City branch which is utilized in washing many of the passenger trains which enter and leave Detroit. Passenger cars are hauled from the coach yard (east of Bay City Junction interlocking) or Detroit passenger terminal, west on the main line until clear of the wye switches west of the interlocking. Then the cars are run north on the Bay City branch until clear

of the wash track switch. After the towerman throws this switch, the cars are pushed through the car washer and out onto the main line back to the depot.

At Vinewood Avenue interlocking daily movements include 4 passenger trains, 4 symbol freights and 30 miscellaneous runs from the Bay City branch; and 10 miscellaneous runs from the old NYC.

The area in which the MC, Bay City branch and the old NYC run is highly industrialized, containing automobile plants, automobile supply plants, and other manufacturing plants, and thus necessitating a considerable number of switching movements. Such movements are not included in the traffic movements mentioned above.

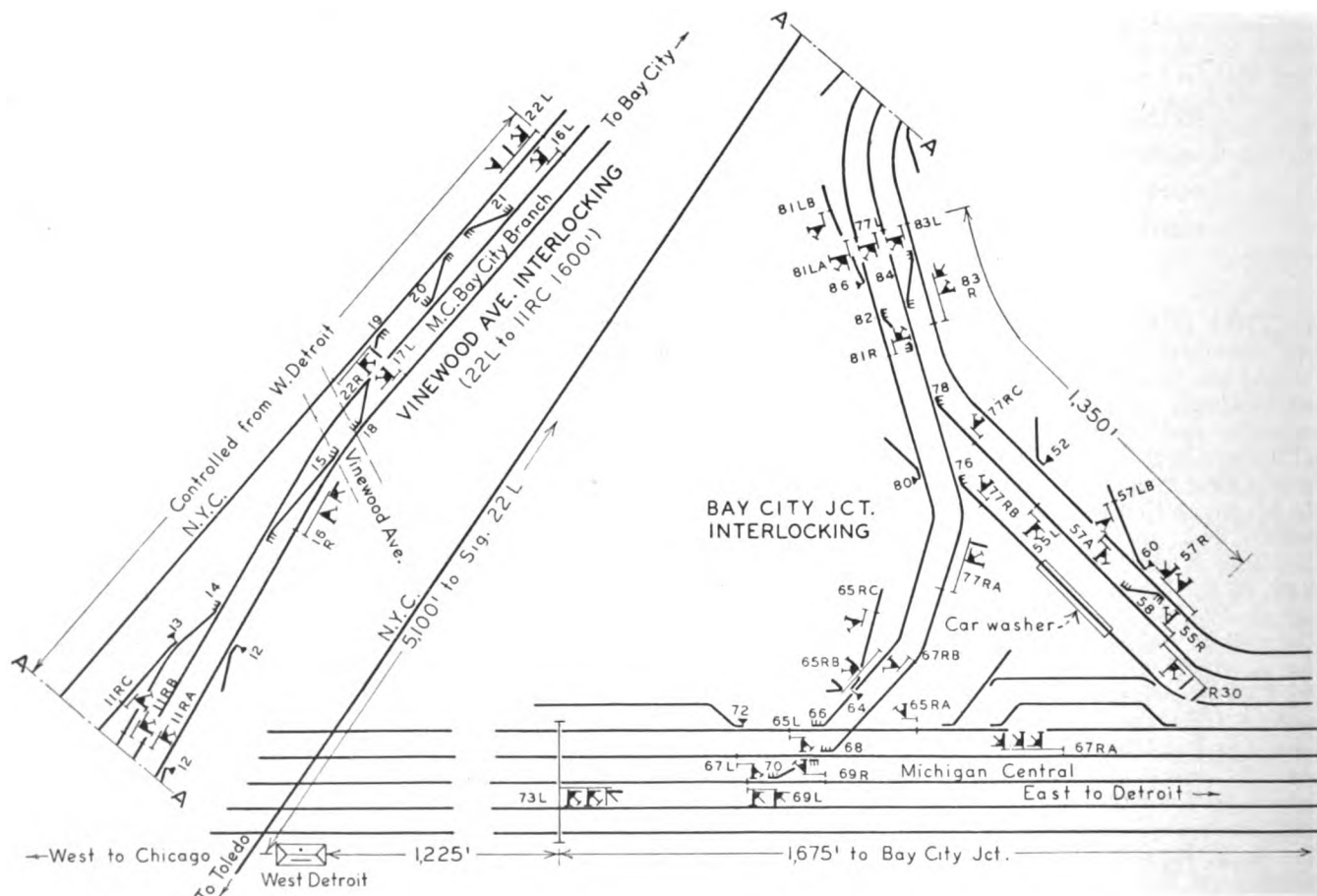
CTC Machine and Controls

These interlockings are controlled by a GRS type K, class M 2-wire coded CTC system from desk type control machines. Because the control machines are similar, the description of a machine will apply to either one. The control machine, mounted atop the operator's desk in the tower, contains the conventional track diagram, with the tracks represented by a white line $\frac{1}{4}$ in. wide.



View of signals 22L and 16L looking toward West Detroit

Track-occupancy lights, located in mediate track sections. Below the track diagram is a row of three-position signal levers. When the signal



Track and signal plan of the Vinewood avenue interlocking and the Bay City Junction interlocking



Battery feeds non-coded d.c. to track

lever is vertical (standing on center position), the signal is controlled to Stop. The lever is turned 90 deg. to the right to clear the signal for traffic movement to the right, and turned 90 deg. left to clear the signal for traffic movement to the left. A green indication lamp is above the "R" and "L" positions of the signal lever. After the signal clears the indication lamp will light, so informing the operator. Below the row of signal levers is a row of two-position switch levers that stand vertical for switch normal, and are turned 90 deg. to the right for switch reverse. A white indication lamp in the center of the switch lever indicates when the switch is out of correspondence with the switch lever, otherwise the lamp is dark. Below the switch levers is a row of push-buttons. These are code starting buttons, and are pushed each time the operator desires to send a control code into the field to operate a switch, clear a signal or unlock an electric lock on a handthrow switch. Indication lamps are located above the code starting buttons. The control machine is also equipped with an annunciator bell which rings when a train enters the approach sections to the interlocking. White indication lamps are located in the track diagram on the approach sections which are lighted when indicating track occupancy.

At Bay City Jct. the new interlocking facilities include 4 power crossovers, 4 power switches, 19 searchlight dwarf signals, 4 searchlight high signals, and 6 electric locks on hand-throw switches. At Vinewood avenue the interlocking consists of 3 crossovers, 3 power switches, 6 searchlight dwarf signals, 2 searchlight high signals, and 2 electric locks on hand-throw switches.

Electric Locks on Hand-Throw Switches

All main track hand-throw switches are equipped with Model 9 forced-down electric locks which are controlled from the interlocking towers. When the operator gives permission to use a hand-throw switch, he turns the lock lever 90 deg. to the right, and presses the code-starting pushbutton associated with the lock lever, which gives the unlock. A white indication lamp in the code-starting lever lights after the lock is released. After the switch has been used and relocked by the trainman, the light is extinguished,

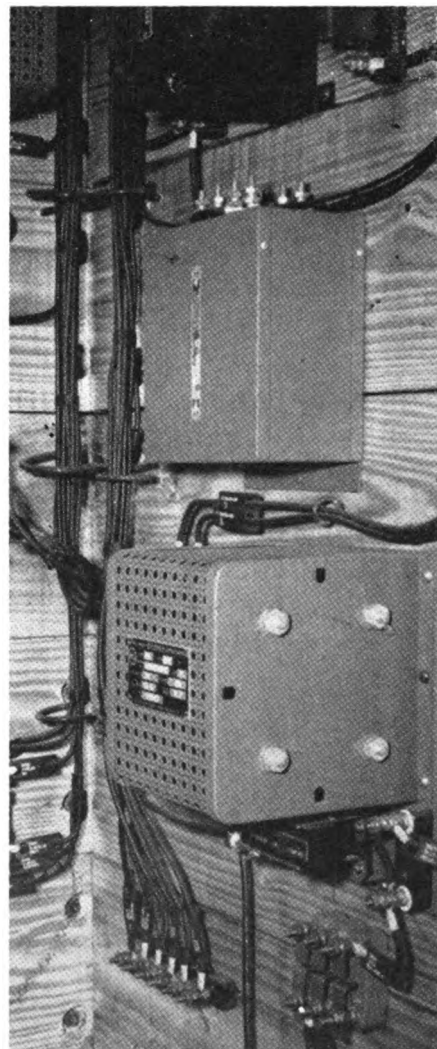
indicating that the switch has been locked.

The switches used on these interlockings are Model 5C, 24-volt d.c. switch machines. Each switch machine is controlled by a biased-neutral switch machine controller housed in the switch machine case. The switch machines are also equipped with an outboard shoe-type brake which stops the movement of the switch points as soon as current to the switch motor is cut off. The switch machines are mounted atop the No. 1 and the No. 2 tie, thus necessitating offsets in the throw rod, lock rod and point detector rod. Adjustable rail braces are on the No. 0, No. 1, No. 2, No. 3, No. 5 and No. 7 ties. The turnouts are No. 10 with 16-ft. 6-in. points, and 127-lb. rail is used.

The dwarf and high signals are type SA searchlight signals. The majority of main track dwarfs are three-aspect signals, while the rest are two-aspect signals. The high signals are either two or three "arm" signals with at least one of the "arms" displaying three aspects. The track circuits are non-coded d.c., end-fed, from Exide 120-a.h. storage battery. GRS copper oxide rectifiers supply d.c. to the storage battery.

Multi-conductor cable is run underground and aerially from the field station bungalows to the relay cases, switch machines and signals. Control wires are No. 10 and No. 12 AWG Copperweld, and No. 6 AWG is used from the field stations to the switch machines. Field station bungalows were provided at Vinewood avenue, and at Bay City Junction at either ends of the wye track and at the crossovers just north of the wye connection with the Bay City branch. These field station bungalows, as well as one at the Bay City Jct. tower, which contains the office equipment, were made by the Massey Concrete Products Co. Raco rail-head bonds were used throughout the interlockings. Because of the heavy traffic over the interlocking territories, quick and easy changing out of relays was necessary. Therefore, plug-in type B relays were used throughout. Type A relays are used for secondary circuits. Solderless terminals, made by Aircraft-Marine Products, were used throughout in the wiring of cases.

The interlockings were planned and constructed under the direction of J. A. Moore, signal engineer, Michigan Central. The steel relay cases and housings, as well as other items of signal equipment, were furnished by the General Railway Signal Company.



Copper oxide rectifiers feed batteries