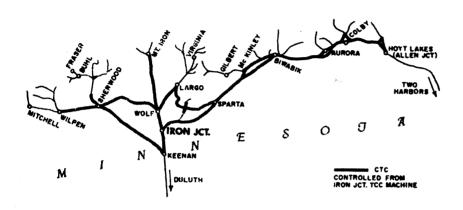
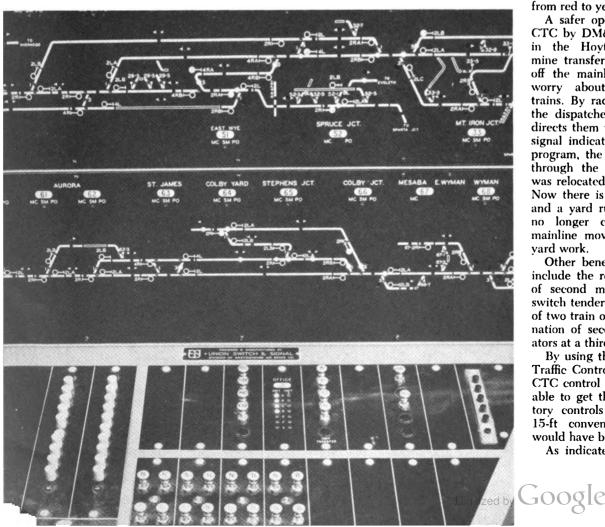
DM&IR Consolidates CTC Control

T o more efficiently serve an extensive iron ore mining area in northern Minnesota, the Duluth, Missabe & Iron Range has consolidated the controls of 83 miles of centralized traffic control into a Traffic Control Center at Iron Jct., Minn. The CTC territory (see map) connects train assembly yards and serves important lines running to several iron ore mines.

Traffic during the mining and lake shipping season (April to December) will total about 30 trains and 85 switch and mine transfer moves every 24 hours. Empties are distributed from assembly yards, such as Biwabik, Wilpen or Rainy Jct., to the mine areas (Mt. Iron or Sparta, for example). The



CTC territory (above) connects many important iron ore mines and train assembly yards. TCC machine (below) has pushbuttons for selecting controlled locations, and operating switches and clearing signals.



switch runs return to the yards we loaded ore cars (70 tons each), whe they are made up into $9,000\text{-}11.0^\circ$ long-ton trains for movement to \pm DM&IR's Lake Superior docks at Te Harbors and Duluth.

Prior to the CTC consolidate which also included installation about 40 miles of traffic control, my of this traffic was handled by ta order operation. Considerable dela were encountered by mine or swith runs waiting for orders and clearn to enter mainlines from the m branches. Under CTC, a mine or swith run crew radios the dispatcher wh they are ready to enter traffic cont territory. The dispatcher looks at it TCC machine panel and if it is de as far as this mine run is concerned gives them the "OK" to come on 1 is a power switch location, he reves the switch and clears the signal. If t mine branch line enters the main through a hand-throw switch, the will be an electric lock on the switt Movement into the mainline will i governed by a dwarf signal. After t ceiving permission from the dispatch a member of the train crew will opt ate the lock. After the unlock, reven of the switch clears the dwarf size from red to yellow.

A safer operation is credited to the CTC by DM&IR officers. For example in the Hovt Lakes-Sparta territy mine transfer crews can work on # off the mainline and do not have worry about clearing for main trains. By radio or telephone thes the dispatcher about their moves H directs them via CTC and they run signal indication. As part of the CI program, the old mainline which wa through the center of Biwabik 🗤 was relocated to the south of the var Now there is a CTC single-track mu and a yard running track. Yard nov no longer cross the mainline, a mainline moves do not interfere ut vard work.

Other benefits of the CTC prographic prographic prographic prographic prographic provides the removal of about 20 mm of second main track, elimination (switch tenders at two yards, the class of two train order offices, and the elimination of second and third trick operators at a third location.

By using the Union Switch & Si⁵⁷ Traffic Control Center pushbutton-¹⁴⁷ CTC control machine, the railroad ⁴²⁴ able to get the 83 miles of CTC ten tory controls into a 9-ft machine.¹⁵ 15-ft conventional style C machine would have been required.

As indicated earlier, radio and the

Miles

one communications are brought into Iron Jct. dispatcher's office. Eight phone lines are terminated on the C machine, which also includes the 2 selector that works on these lines. dual frequency (yard and road) I&IR base radio station is located e, and the controls are terminated the TCC machine. A third base io station, with its controls on the patcher's TCC machine, handles at Northern radio. This enables GN ws to contact the DM&IR dispatchat Iron Jct. regarding their entrance l exit from CTC territory between lpen and Largo, over which GN has ckage rights. CN runs two trains each

y daily during the mining season. Because there are a considerable nber of setouts and pickups, the 4&IR makes use of a call-on aspect d over red over yellow) to give an gineman a signal to get back on his in. A back-to-train stick circuit is 'd, in which the stick relay picks up en the signal clears and the associd track relay is down. Where a long proach circuit is involved, this is cut provide a 1,250-ft back-to-train cirt. Where the call-on aspect is used closing up moves, it will progresely climb as the train ahead moves t

For detector track circuits, DM&IR ss 120-coded DC, powered by one l of lead storage battery. The coded c will work up to 9,000 ft and prole better shunting and more posie indication of occupancy than ady energy, says the road's signal partment.

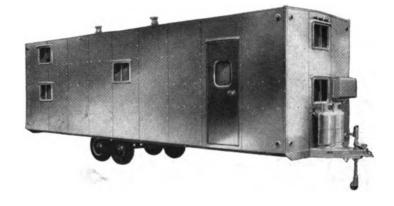
Trains enter CTC sidings at reicted speed and leave on high signals ough the No. 16 turnouts. Maxiim speed for loaded ore trains is mph with a 5-mph tolerance, and mph for empties. At junctions, trains eive a diverging-clear (red over en) over the switch reversed. As s is a two-arm searchlight signal ed only in the top arm; and red, llow or green in the bottom arm) light-out relay is used to cut out the ver arm if the top-arm light is exguished. This is done so the signal ll not appear as an automatic with a gle aspect if the top-arm red lamp rns out or is otherwise extinguished. Engineering and installation was rected by Harold S. Spindler, former inal engineer (now retired), and vain Colpaert, signal engineer, under e jurisdiction of R. B. Rhodes, chief gineer. Signal equipment was furshed by Union Switch & Signal divim of WABCO. RSC



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